FLIGHT

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OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

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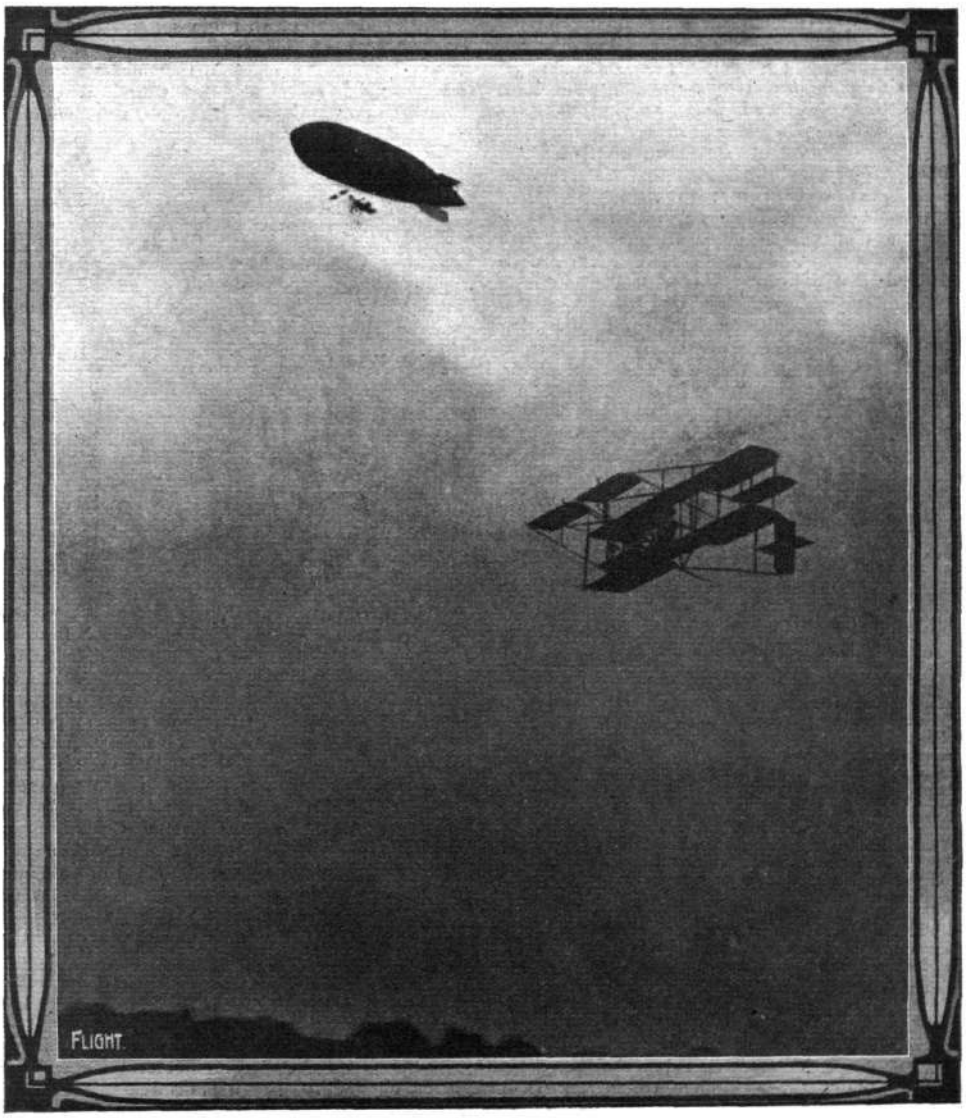


BRITISH ARMY AND AERONAUTICS.—Unique photograph of the Army airship "Beta" and Mr. S. F. Cody's new biplane in flight at Aldershot at 7 p.m. on Thursday the week before last. It is gratifying to know that both these craft are equipped with British-built Green engines.

"THE NEW ARM."

DURING the comparatively short time that has elapsed since flight in the heavier-than-air machine became a really practical every-day proposition, it has—even to the man in the street—progressed in its development in a manner which the most sanguine enthusiast of the new science could hardly have anticipated. But even those who have closely followed the movement and who know practically all there is to be known of aviation as at present understood have been astonished at the demonstration of practical utility which the aeroplane has given during recent military manœuvres abroad, particularly in France.

The object lesson that has been received is of the utmost value, for many reasons. It has been the fashion, even among those who should have known better, to hold that the aeroplane could never become anything more than an interesting toy. It could never develop into a practical, passenger-carrying vehicle; and, above all, it could never be used except on the calmest of days and under the most favourable conditions. If the recent army manœuvres have done nothing else, they have at least given the lie to such pessimistic opinions as those in question. Generally, the conclusions to be drawn from what the aeroplane has accomplished are that it is most emphatically not a toy; that even in its present relatively crude state it is a practical man-carrying machine; and that it is essentially destined to become an all-weather vehicle. It has not, it is true, been demonstrated that it can be used effectively in a hurricane, but taking an average through the weather that prevailed during the manœuvres it is safe to say that the aeroplane did demonstrate that it is possible to make useful flights on the great majority of days in the year. And this is very satisfactory indeed to those who have any deep interest in its development, considering the infancy of the science. So much for the general aspects of the question.

Proceeding for a moment from the general to the particular, one of the main facts brought to light by the doings of the past fortnight is that the improvement in the reliability of the aeroplane has been far greater than most people imagine. That has been amply shown by some of the individual feats of flying that have been accomplished by French military aviators. Let us quote from Mr. Holt Thomas' letter to the *Daily Mail* of last Monday, in which he describes some of his own observations during the manœuvres. He says:—

"I followed Caillè, Paulhan's pupil, from St. Cyr to the camp at Grandvilliers. This flight was simply to avoid the bother and cost of transit. Caillè left in a Farman machine at 5.30 on Saturday evening (10th inst.) and came down at Pont St. Maxence at about 6.30. On Sunday he resumed his flight at about 5 a.m., alighted at Beauvais to look at his ignition and inquire the way, restarted the machine with the aid of some men out shooting, and arrived at the Parc d'Aviation, coming down opposite the hangar arranged for his reception. As he flew, to avoid the environs of Paris, the distance was about 275 kiloms., practically a London-Manchester flight. I was driving Paulhan in his auto, as he had broken his wrist, and both of us would have been surprised if Caillè had not arrived safely, notwithstanding the fact that it was only the eighth time he had left the ground, and his first cross-country flight. His flight expresses the progress made in aviation between April (date of winning your London to Manchester prize) and September."

The record of progress, even in a short six months as set forth in this letter, is simply marvellous, and should give pause even to the most careless of thinking people.

Now we come to another aspect of what has been demonstrated during these autumn manœuvres. It is generally agreed by many who are well qualified to express an opinion, that the aeroplane, even at its present stage of development, has already resulted in an urgent need for the entire revision of all accepted schemes of tactics in warfare. Trials abroad have shown that the presence of the reconnoitring aviator renders all a commander's dispositions as plain and open to his opponent as though that opponent were in possession of all his plans of attack or defence. Not a detail of his dispositions can escape the eye of the observer, moving swiftly above the enemy's position, hundreds of feet in the air, and travelling at a speed which renders him virtually immune from gun-fire, except with the intervention of sheer bad fortune. In this last connection it is well to admit that this immunity is simply hypothesis, though it is hypothesis based upon the dicta of military experts who should know of what they speak. It is one thing to make observations of an opposing force in peace time, when there are no bullets in the rifles and no shells in the guns, but may well be an entirely different matter when not only is the hostile aeroplane the mark of every rifle and every gun within range, but when it may expect to encounter the attacks of the enemy's air-craft, whose mission it is to prevent the aviator from obtaining that very information that has proved so valuable to the commanders on either side in the recently-ended mimic war on the other side of the Channel.

However, it is hardly within our province to elaborate any purely technical aspects of the use of aeroplanes in warfare. That must be left for the military authorities themselves to discuss and work out to their own satisfaction. What we, who are rather concerned with the commercial development of the science, are rejoiced to see in the upshot of recent doings abroad is the one salient fact that aviation has now reached a stage when the State simply cannot afford to continue to stand aside and leave further development to the private capitalist. We have before emphasised the fact that though the aeroplane can be and will be used as an instrument of war, yet its real future lies far more in its adaptability for commercial purposes, just as has been the case with the railway train, the motor car, and the steam turbine, in contradistinction to the big gun, the torpedo, and the submarine. Therefore, we welcome whole-heartedly the successful application of the heavier-than-air machine to military operations, because it is now incumbent upon the Governments of the civilised world, and particularly upon our own—who have been lamentably apathetic during the manœuvres now in progress—to assist with men and money in its development. That is the line we have taken all along, even before it was so dramatically demonstrated that in the aeroplane existed a factor that bids fair entirely to revolutionise the conduct of warlike operations. At the moment of writing our own manœuvres have done nothing whatever to emphasise the lessons learned by the French Army, although the authorities cannot long ignore what has taken place across the Channel and must speedily be forced to embark upon the subject in a much more serious manner than they have hitherto shown signs of doing. If only they consent to follow the dictates of ordinary common sense, we confidently predict that this country will before long assume her rightful place at the head of the nations. Fortunately the contrast between France and England as regards enterprise displayed in recent manœuvres is not being allowed to pass unnoticed in the Press of this country.

FLIGHT PIONEERS.

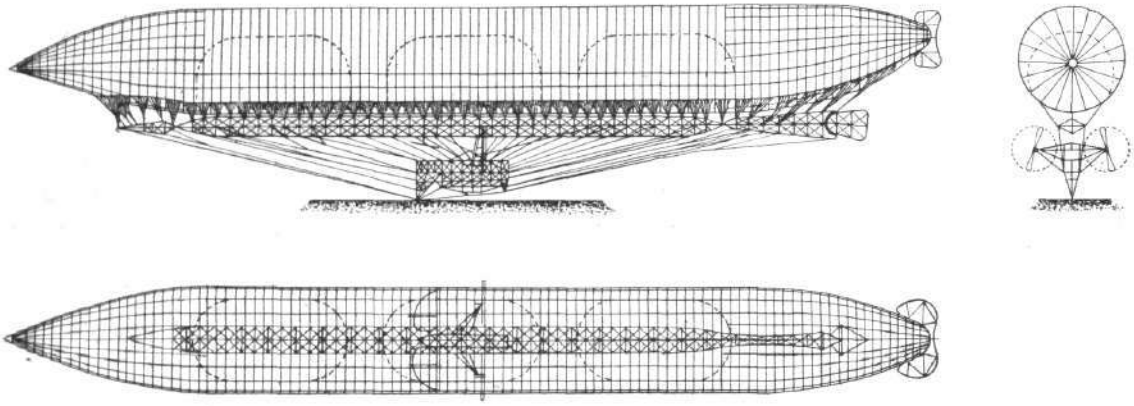
MR. G. A. BARNES.

THE "MORNING POST" NATIONAL FUND AIRSHIP.

As every Briton knows, and as every patriotic Briton fully appreciates, the Lebaudy military airship which we are now about to describe owes its existence—or at least its British proprietorship—to the extremely laudable enterprise of one of London's most justly respected leading morning newspapers—to wit, the *Morning Post*. That journal it was which, at a time when the science of aeronautics was being most sadly neglected by those in high authority in this country, as compared with the activity of foreign contemporaries, aroused the British public to the risks that were being incurred, and organised in its columns the National Fund with which this latest ship has been acquired. Now, therefore, the result of their action has materialised into a real war-type of dirigible, than which no more up-to-date model exists throughout the world.

Built by MM. Paul and Pierre Lebaudy, at their works at La Villette and Moisson to the plans of their engineer, M. Julliot, this airship belongs to the type known as "semi-rigid"—that is to say, on the one hand, the rigidity of the exterior form of the gas-bag is obtained by the use of ballonets and ventilators; on the other hand, the gas-bag carries immediately beneath it a combination of two kinds of planes, namely, horizontal and vertical planes, movable and fixed, which enable the balloon to be steered in any direction, and which ensure stability.

The combination of fixed planes forms a rigid under-frame, which divides the suspension by which the car is hung from the gas-bag into two parts. The upper part between the under-frame and the gas-bag is short, and, if the gas-bag becomes limp and loses its shape, cannot break or tear the envelope through uneven and excessive tension; the lower part of the suspension between the under-frame and the car, that is to say, between two rigid bodies, can be of considerable length without risk of uneven and excessive strain, no matter what may be the variations in the pressure of the gas and in the shape of the gas-bag.



The "Morning Post" National Fund Airship.

The essential parts of the "dirigible" are:—(1) The gas-bag or envelope; (2) the fixed and movable planes; (3) the car; (4) the suspension or hanging gear; (5) the motors; (6) the propellers; (7) various accessories.

The envelope is 103 metres (337 ft. 10 ins.) in length, 12·02 metres (39 ft. 5⅓ ins.) in diameter, and has a cubic capacity of 10,000 metres (353,165·8 cubic feet). In the bows it tapers to a sharp point, and is egg-shaped at the stern. It is composed of panels of waterproof canvas, consisting of two tissues of cotton and two layers of vulcanised indiarubber, superposed alternately, these panels being glued and sewn together. The outer tissue is dyed an inactinic yellow to diminish the injurious effects of light on the rubber, while the interior layer of rubber makes the envelope more gas-proof, and preserves the cotton tissue from the injurious effects that might be caused by impurities in the gas.

Thanks to the care with which it is constructed, it loses considerably less than 1 per cent. of its volume in gas in every 24 hours. To be precise, the loss of hydrogen is only ·6 per cent. The envelope is provided in its lower surface with two valves of large diameter, which allow for the escape of hydrogen, more particularly while the balloon is in flight. These valves are automatic; that is to say, they open as soon as the pressure of the gas in the envelope becomes excessive. Further, they can be worked by hand. There is, in addition, a valve at the top of the gas-bag, which is usually closed by a diaphragm. This valve can only be worked by hand, and allows the balloon to be entirely emptied. The two lower valves are placed in the stern of the gas-bag to avoid all risk of ignition from the motors. In cases of emergency two long ripping panels, one fore, one aft, glued and only lightly sewn to the rest of the fabric, allow the balloon to be completely deflated in a few seconds. By means of four observation holes, each covered with glass and framed with aluminium, the condition of the interior of the balloon can be inspected visually when it is at rest in its shed. Water and metal manometers show the pressure of the gas in the envelope at any given moment.

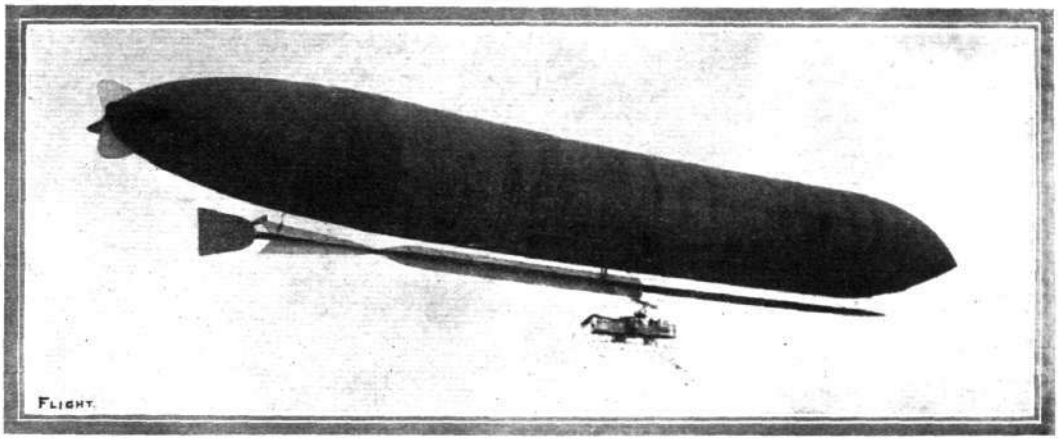
There are inside the gas-bag three ballonets that can be filled with air under pressure, so that when the gas contracts or is lost the pressure within the envelope, which preserves the shape and rigidity of the gas-bag, may be maintained. These ballonets have a capacity of over 2,500 cubic metres, or rather more than a quarter of the capacity of the balloon. Their size is an important factor in enabling the airship to travel at a height of from 6,000 to 6,500 ft., an altitude far beyond the range of an enemy's fire. The ballonets fore and aft of the central one have an additional purpose. By forcing air into one or other of them the pilot can change or regulate the longitudinal equilibrium of the airship so as to make it fly point upwards or downwards at any angle he wishes. Each ballonet is provided with a safety-valve, which opens automatically and allows the air to escape at a pressure slightly inferior to that of the gas. When need arises these valves can be worked by hand.

The air required for the ballonets is pumped into them by two powerful centrifugal fans which can work either separately or together, and are each of them driven by a separate motor, so that in case one engine breaks down it will still be possible to use the other fan. The air is forced into a collector, whence it is admitted into any of the three ballonets that the pilot desires. In the very exceptional case of all three ballonets being filled before the end of the flight—that is, if loss of gas and contraction should reduce the volume of the hydrogen in the gas-bag by more than a quarter—air can be pumped directly into the gas-bag, so that under no circumstances need it lose that rigidity which is indispensable to a dirigible balloon. The outside of the envelope is provided with flaps made of layers of canvas glued and sewn together. These flaps are known as "ralingues." In them are fitted short wooden pegs of the type used in spherical ballooning, set in a continuous and flexible line, and to them the extreme ends of the cordage for suspension are firmly attached.

The movable planes, which are intended to steer the airship both horizontally and vertically, consist of—

1. A vertical plane articulated round an almost vertical axis. The word "almost" is used advisedly, since in case of accident the rudder falls into a neutral position in wholly automatic fashion. This is the rudder in the ordinary sense of the word. It is placed immediately below the gas-bag at the stern of the rigid under-frame, which transmits its action directly to the dirigible.

2. Two horizontal planes with rounded angles, articulated round



The "Morning Post" national dirigible upon the occasion of its first journey at La Roche Guyon on September 14th.

the same horizontal axis which is fitted to the under-frame below the centre of the balloon. By deflecting these planes the pilot can make the airship rise in a direction parallel to itself without throwing out ballast, and he can in the same way make it descend.

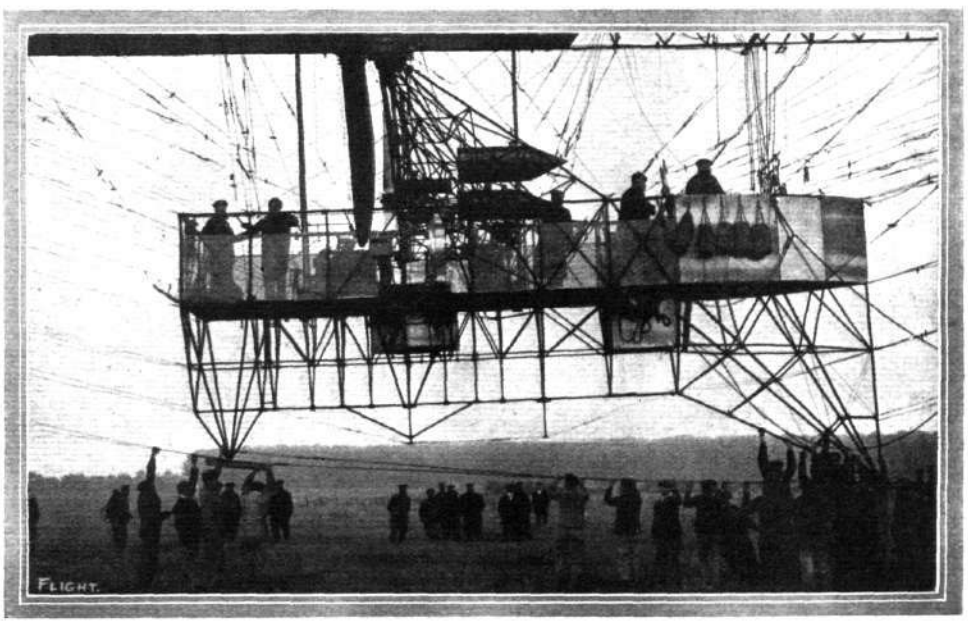
Similar axes are fitted to the under-frame, both fore and aft, to carry like planes which allow the whole balloon to be inclined for the purpose of rising or descending. The trials will show the value of these pairs of horizontal rudders, and will decide whether it is advisable to keep both pairs or either of them.

The fixed planes, which, like the movable planes, are built of steel tubes with canvas stretched over them, are both horizontal and vertical, and are arranged as follows:—

1. The tail fins (the *papillons* or *empennage*), vertical and horizontal planes, shaped rather like the wings of a butterfly and fitted along the axes of the egg-shaped stern of the gas-bag. These fins prevent the airship from rocking and pitching or going forward in zig-zag fashion under the forward thrusting pressure of its engines.

2. The rigid girder-built under-frame immediately beneath the gas-bag, consisting of three articulated parts—the forepart, which is small, angular, and covered with canvas in the horizontal plane; the central longest portion (80 metres or 262 ft. in length), rather narrow (3 metres or 9 ft. 10 ins. in breadth), 2 metres or 6 ft. 6¾ ins. in height, covered with canvas for its whole length in the horizontal plane, whereas vertically only the stern half is canvas-covered; and finally the tail-piece, which is cruciform and shaped like the feathers of an arrow, canvas-covered both horizontally and vertically, and ending in the rudder. The articulated bow and stern extremities can only be adjusted with the balloon at rest, and are fixed during flight.

This combination of planes ensures the horizontal and vertical



NEARER VIEW OF THE CAR OF THE "MORNING POST" DIRIGIBLE.—20 passengers can be carried in this. The vessel is driven by two 4-cyl. Panhard motors of 135-h.p. each, the two wooden propellers being of 5 metres each.

stability of the balloon when it is under way. With the further aid of the horizontal rudders and the three ballonets, the pilot is enabled to make the airship rise or descend by inclining it at an angle, and making it glide along on the same principle as an aeroplane with a very large area, both the upper and lower surfaces pressing against the air. In the earlier airships of this type only the lower surface of the under-frame could come into action, as the underframe was fixed immediately to the envelope, and there was no free air-space between them. The fire-proof canvas of the under-frame protects the envelope and the gas within it from all danger of combustion from the motors.

The underframe is provided with rings and hand ropes, and a whole collection of steel cables called the *chevelure*, which, fastened as they are so near the gas-bag, allow the balloon to be easily manœuvred when it is on the ground, and if need be to be firmly anchored. It is obvious that the unwieldy gas-bag can only be imperfectly controlled when the airship is on the ground unless the ropes which hold it firm are fastened to a point at no great distance from the gas-bag. This is one of the advantages claimed for the semi-rigid type over the non-rigid airship, which can only be anchored from the car at relatively a great distance below the gas-bag.

When the airship is at anchor, if the wind becomes too strong and takes it sideways, it can be immediately deflated by the ripping panels in the bow and stern. These panels can be torn out by pulling the red cords which are attached to them. As soon as the balloon lands these cords are taken from the car and attached to stakes driven into the ground, while a man is set specially to watch them. Should it chance that a sudden violent wind arises, and in the confusion of the moment no one thinks of using the ripping panels, as happened in the case of the "Patrie," as soon as the balloon begins to be driven from its moorings the strain on the cords held fast by the stakes will tear out the panels, the gas will escape in a few seconds, and the whole fabric of the balloon will collapse, offering no further resistance to the wind. It is in this matter, among others, that the semi-rigid airship has a valuable advantage over those of the Zeppelin type, which owing to their permanent and enormous frames cannot be deflated with any advantage, even if ripping gear were provided against occasions of emergency.

The car is solidly built of steel tubes and is incombustible. It is relatively short and only touches the ground with a single point. This point, which is very strongly constructed of pyramidal steel tubes, is placed in the bow, and when the airship is at anchor serves as a pivot on which the whole balloon may be swung round in any direction so as to avoid being taken sideways by the wind. In the case of the car bumping along the ground a second and shorter point of similar pyramidal construction in the stern comes into contact with the earth before any of the vital organs of the vessel, such as the rudder and so forth, can be injured. The propellers also are well out of danger, but as any damage done to them may have serious consequences, there is a special arrangement by which they may be turned by hand from their normal vertical position to a slanting position, parallel to the steel tubes of the outriggers that support them, which places them in complete safety.

The car consists of a horizontal metal flooring. Beneath it are a rigid framework, which renders the car indeformable, and the two landing pivots. Above the flooring there is a rail, 4 ft. 3½ ins. high, closed in in the bow with aluminium plates, and in the stern with metal gauze or grill. The interior is divided into compartments, all of which communicate from stem to stern, and are used for the following purposes:—

1. The compartment of the look-out men or passengers is right in the bow, so that nothing may interfere with the view. Its shape tapers towards the bow.

2. The compartment of the aeronauts, where the pilot and one or two assistants are stationed to direct the course of the airship vertically and horizontally, with the wheels regulating the planes and rudder, and all the machinery controlling the vessel beside them.

3. The compartment for the landing apparatus, guide-ropes, anchors, and "serpents" for use either on land or at sea. The serpent for land use consists of a heavy cable sheathed in canvas and attached to a long light rope. It is thrown overboard just before landing. In this way the balloon is lightened, but it is only necessary to pull on the rope attached to the serpent to bring the weight of the cable again into action. The serpent for use at sea works on the same principle, but consists of a number of blocks of wood united by a rope that will float on the surface of the water.

4. The compartment of the chief mechanician.

5. The compartment of the motors.

6. The stern compartment for the assistant mechanicians, additional passengers, ballast, reserve petrol, and so forth.

The car can carry 20 persons.

As has been said, the suspension consists of two parts—the one above, the other below the under-frame. The upper part is mainly composed of hempen cords, each series branching out from a single point. These connect the flaps of the gas-bag with the points of resistance of the under-frame. Each cord is provided with a screw-joint to regulate the tension, and by a system of wooden pegs that fit into loops (*cabillots de démontage*) can be quickly unshipped without altering its length. The cords are arranged in V-fashion so as to ensure the connection of the gas-bag and under-frame without any possible variation either laterally or longitudinally.

The lower part of the suspension is of steel and is incombustible. By indeformable triangles it unites the joints or meeting-points of the steel tubes of the under-frame above and the car below. Each cable is provided with a screw-joint and a wooden peg for the purpose of unshipping.

The car contains two four-cylinder petrol motors constructed by MM. Panhard et Levassor, each rated at 135-h.p. when turning at 1,000 r.p.m. They are placed length-wise in the axis of the car. Each motor has its partially-silenced exhaust arranged laterally, the one to the right, the other to the left. Each has also a radiator, belt-driven fan, and pump for feeding the petrol. The two radiators set outside the car to right and left can be easily seen, examined and, if need be, repaired. Each motor has dual ignition, namely, by magneto and by accumulators. To right and left of the car there are two oil reservoirs. The petrol is fed to the carburettors from two lateral reservoirs, which are at a higher level. Each engine can take its fuel from either reservoir. The change from one reservoir to the other can be made without stopping the motor.

To increase the radius of action of the airship a third reservoir has been mounted across the stern, which, if necessity arises, also allows the petrol to be used as ballast. The reserve petrol is carried on board in cans, which are poured into the third reservoir as required, whence they are fed by two pumps—one worked by each motor—into the lateral reservoirs. This arrangement makes journeys of a great distance possible, and it should render easy the flight of fourteen hours, during which the airship will have to cover a triangular course of 300 miles, as required by the contract conditions.

Each motor is connected by means of a special type of clutch to the transmitting gear of the propellers. By this arrangement the propellers can be worked by either one of the motors separately or by both at once.

The two propellers are placed symmetrically on either side of the car, and turn in opposite directions at a speed of 360 r.p.m. They are 5 metres (16 ft. 5 in.) in diameter, and are made of wood, canvas-covered, and painted red. They are mounted on two out-riggers fashioned of steel tubes, and not unlike those of a racing boat. They are united by gable-shaped stays, which rise above the centre of the car. If the balloon is deflated or if it descends rather too rapidly, this gable-shaped erection is intended to receive the weight of the under-frame, so that the gas-bag is held at a distance from the car and there is no danger of it falling on the gas-bag or catching fire from the motors. The propellers are mounted at such a height that they cannot touch the ground or suffer injury, if, when camping out in the open, the balloon is attacked by a side wind and turns over to right or left.

The airship is provided with various accessories, several of which have been already mentioned: Landing tackle—Two guide ropes, one anchor for land use, one cone anchor for use at sea, one "serpent" for land use, one "serpent" for use at sea, as well as the following regulating instruments: One water manometer, one metal manometer, one ordinary altitude barometer, one registering altitude barometer (carried on the gas-bag to avoid vibration—can only be consulted when the airship has landed), one liquid compass, one statoscope, and alighting apparatus, and so forth.

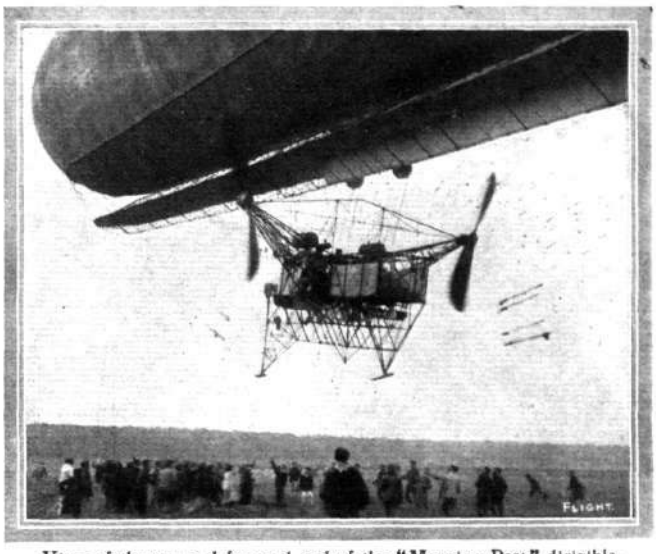
This particular airship is distinguished from the earlier Lebaudy semi-rigid dirigibles by a number of modifications and improvements, partly suggested by an experience unequalled by that of any other firm of aircraft constructors—the first Lebaudy airship began its trials in 1902—and in part required by the conditions of the problem which M. Julliot, the engineer to the firm, has to solve for the British War Office. The conditions laid down as a preliminary to the acceptance of the balloon and its presentation to the British Army are admittedly severe, and indeed have never yet been fulfilled by any dirigible balloon to date. Compliance with these conditions necessarily involved a vastly greater increase in the size of the gas-bag, a factor on which depend the weight that can be lifted, also the length of time during which the airship can remain in the air. M. Julliot estimated that in order to fulfil the requirements of the contract this latest airship must have a capacity of 10,000 cubic metres. The largest balloon of the Lebaudy type hitherto constructed, the "Liberté," has a hydrogen capacity of only 4,500 cubic metres, so that the National Fund Airship is more than double the size of the largest of its predecessors. The first airship constructed by MM. Lebaudy had a cubic capacity of only 2,666 cubic metres, and events have proved that M. Julliot was well justified in prophesying at the time in a lecture given to the Société

des Ingénieurs Civils in 1902 that airships would soon be constructed of far more than 3,000 cubic metres capacity and fitted with engines far more powerful than the 30-40-h.p. motor by which the first Lebaudy dirigible was driven.

It is noteworthy that the increase of capacity has been principally obtained by the lengthening of the gas-bag; not by an augmentation of its diameter. The National Fund Airship is 103 metres long, while the length of the "Liberté" is only 70 metres; but whereas the diameter of the dirigible for the British Army is only just over 12 metres, that of the "Liberté" is 11½ metres. The result is that the central cylindrical portion of the envelope is of great length and extremely slender in shape. The length is more than eight times the greatest diameter, while in the "Liberté" that co-efficient was less than 7, and in the original "Lebaudy" only 5·89. This greatly-increased length results in a proportionate decrease in air resistance and consequently relatively a higher speed. As concerns the gas-bag itself, the principal improvement introduced is the provision of three ballonets for air under pressure instead of one. A single central ballonet naturally could not affect the longitudinal equilibrium of the airship, but in the new vessel air can be pumped at will into either the fore or aft ballonet. Since such air acts as ballast the bow or stern of the gas-bag can be made to rise or fall at the wish of the pilot.

The most striking modification in the new airship affects the girder-built rigid under-frame. In the earlier models of this type the canvas-covered under-frame was attached directly to the gas-bag. As the air could not circulate freely between the under-frame and gas-bag, and tended to tear them apart, the space between the receding sides of the gas-bag and the under-frames was in the bows covered in by a canvas screen which prevented the circulation of the air when the balloon was under way. In the National Fund Airship, however, there is a free air-space between the gas-bag and the horizontal plane of the under-frame. The horizontal plane is suspended from the envelope by the steel stays that rise perpendicularly from it. The stern half of these stays is canvas-covered, forming a vertical plane that plays the part of the central feather on an arrow. The consequence is that both the upper and lower surfaces of the horizontal plane come into operation and, by their resistance to the air, prevent the balloon pitching. This device, which doubles the air resistance of the underframe has enabled M. Juliot to reduce its breadth to 3 metres without decreasing its effective action. Such a reduction is of great value in adding to the portability of the airship. Though in the original "Lebaudy" the under-frame was over 6 metres broad and in the "Liberté" 6·20 metres, the far smaller breadth of under-frame in the new airship offers a greater air surface.

As has been indicated, the new airship can be fitted with three pairs of horizontal rudders, one pair at the stern, another amidships, and the third in the bows. Earlier models have only been fitted with horizontal planes in the stern and amidships. In the new airship the bow planes will be in the nature of an experiment; hence they are readily detachable. M. Julliot considers there is no doubt that they will prove most effective, far more so, indeed, than the other horizontal planes. It is merely a question whether they may prove too powerful, since, as the nose of the gas-bag rises, their effectiveness increases. The car differs from all others built by MM. Lebaudy in that the single landing pivot on which it rests on land is in the bow and not amidships. This change is designed to facilitate the turning of the balloon when it is camped out in the open. In such circumstances it is desirable that its nose may be always and readily kept towards the wind. The forward pivoting landing point is supplemented by a minor one on the rear. In the older types the compartment for the passengers and look-out men was placed in the stern, where the propellers interfered with the view. In the new airship this compartment is forward right in the bows, thereby affording an uninterrupted view ahead. The gondola or car can accommodate twenty persons, whereas the largest of the series hitherto has a maximum crew capacity of ten. Moreover, the new dirigible is the first of its type to be fitted with two motors and two independent centrifugal fans for pumping air into the ballonets. The importance of this change is obvious. If one of the motors breaks down the propellers can still be worked by the companion engine, so that the balloon can still be steered effectively, and a fan-fashioned pump can still be worked to force air into the ballonets; hence an accident to one motor would not involve the gas-bag losing its shape. Another great point as far as safety is concerned is that, at need, air can be mechanically pumped direct into the gas-bag itself to maintain the true shape of the master envelope after its supply of hydrogen shall have become greatly exhausted. As regards the motors, the National Fund Airship is the most powerfully-engined balloon yet produced by MM. Lebaudy, proportionately alike to its diameter and cubic capacity. Certain changes have also been introduced with reference to the storage of petrol and its use as ballast. Finally, the vessel is the first one constructed by the firm to be provided with tackle for use at sea.



View of the car and forward end of the "Morning Post" dirigible.

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THE BALLAD OF THE AEROPLANE.

A sweep, a swirl, a rush of air,
Two wings that flutter in the blue,
Earth like a picture, far and fair,
And then—unbounded space and you.
Perchance some bird may pause to view
Your coming in its rapid flight,
Then leave you free to dare and do
In these great worlds of Space and Light.

Swift, high and sure you rise to where
Your aeroplane flies straight and true,
Then, as you wish, descend, or bear
Still onward for a mile or two.
Oh joy as you go swinging through
The fresh, pure air, and what delight
To know you're free to dare and do
In these great worlds of Space and Light.

Then let them say that we shall ne'er
Be victors in this kingdom new,
Since earth and sea man's rule declare,
The aerial world shall own it too.
The dreams and visions fancy drew,
Shall be revealed to human sight,
And we be free to dare and do
In these great worlds of Space and Light.

Envoi.

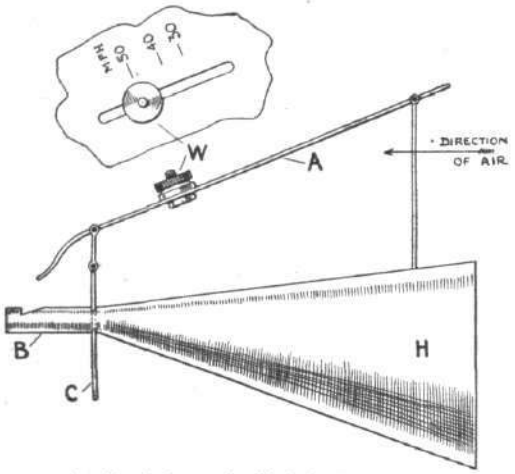
Though now the pioneers are few,
Soon will the dawn rise fair and bright,
When all are free to dare and do
In these great worlds of Space and Light.

DOROTHY M. HAWARD.

SPEED-ALARMS FOR FLYERS.

SOME MORE COMPETITIVE DESIGNS FOR OUR £5 PRIZE.

[11] I enclose a design for a safety speed alarm. The action is as follows :—



A. Metal plate to be lifted by the pressure of air in direction of arrow.
W. Weight for regulating miles per hour.
B. Whistle.
C. Shutter.
H. Air collector.

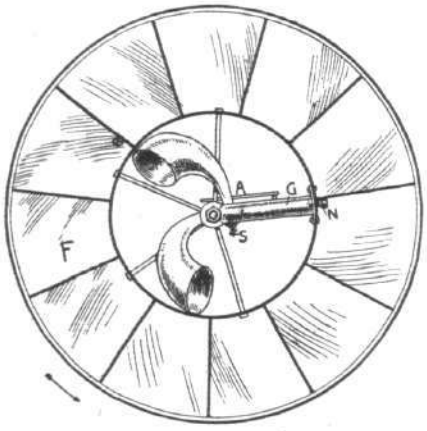
Gateshead. A. R. WILLMOTT.

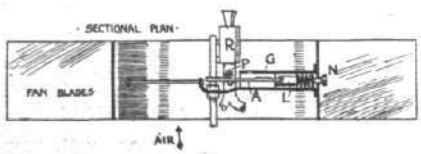
---

[12] I submit the enclosed design, for which I claim the following advantages :—

(*a*) It sounds at both a dangerously slow and a dangerously high speed.

(*b*) It warns some 3 m.p.h. either side of the limit, being in full blast at the dangerous speed.





(*c*) It is easily adjustable to suit maximum speeds between 30 and 80 m.p.h.

(*d*) The governing action is positive, not controlled by mere wind pressure.

The device consists of a horn, blown by the rush of air past the aeroplane when opened by the governor, G, driven by the fan, F. One of the spokes of F is of $\frac{3}{4}$-in. tube, polished on the inside. In this slides a lead plunger, L, thrown out by centrifugal force against a light spring, which can be more or less compressed by the nut, N, so that greater or less rotational speed is required to bring the plunger into a given position, according to the safe critical speed of the aeroplane.

The $\frac{3}{4}$-in. tube is expanded at the centre into a boss for the other spokes. It is held by two nuts to a piece of hard brass tube, which forms the bearing, turning on a fixed shaft. The lead plunger carries an arm, A, which racks into the pinion, P, turning a disc-valve in the throat of the horn, against the small springs, either way.

Where the rack is not toothed, the valve remains closed, the positions of the plunger corresponding to either critical speed bringing the racks into play.

The horns and reed-box, R, turn with the fan ; the mouths of the horns are cut so as to make use of the turning as well as the forward movement. The whole is protected by a fixed outer ring of brass, which is fastened to the bracket carrying the fixed axle.

I have designed a governor having no *forward* motion, as the frequent sudden changes of forward speed in a gale would hopelessly upset such a device. An aeroplane never has any appreciable change of speed *perpendicular* to the planes, so my governor moves in that direction only. My governor is not worked by a piston pressed back by direct air pressure. I think that the sudden pressure drop on opening the whistle would let the plunger back again to close the valve, and no steady blast could result. The pinion turning the disc-valve of the horns is small, thus a small change of plunger position (hence of speed) is enough to open it fully.

Battersea. ARTHUR D. TURNER.

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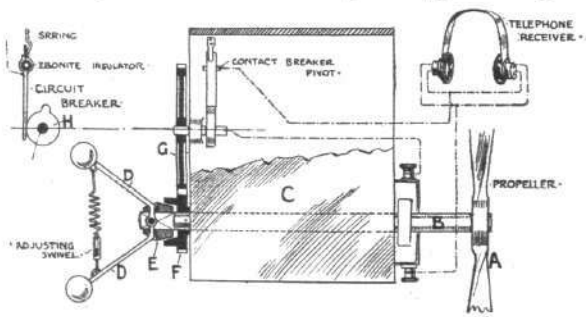
[13] This instrument consists essentially of three parts : the propeller, magneto and telaupad-gear. The propeller, A, is keyed direct to the magneto-shaft, B. The magneto, C, is of very light construction, as very little current is required. The left end of the magneto-shaft is squared to receive the clutch and governor ; the method of working is as follows :—The arms, D, of the governor are pivoted at the centre of the squared shaft and pass through slots in the sleeve, E, which revolves with and is free to slide on the square shaft. When, owing to centrifugal force, the arms extend, the sleeve is moved to the right, and in so doing engages the cone-shaped clutch into the small gear-wheel, F, which is free to revolve loosely round the main shaft. This pinion engages in the larger



gear-wheel, G, which operates the make-and-break. This is so constructed that when at rest there is always contact, but the toe of the cam, H, "throws off" sufficiently when in motion to effect a break, thus preventing any chance of "dead centre" causing a continuous break in the circuit. The current goes from the positive brush through the make-and-break to a pair of "telaupads" (telephone receivers), which are worn over the ears of the aeronaut, and then back to the negative brush. The action of the complete instrument is as follows :—Up to a certain speed a gradually increasing buzzing is heard, then at an easily adjustable speed, *i.e.*, the speed considered dangerous to the construction of the particular

machine, the governor clutches in the make-and-break, which, owing to the gearing, causes a perceptibly interrupted buzzing to be heard. A small switch could be fitted so that the instrument may only be connected when required. Well designed the total weight need not in any way be excessive. This would seem to be more efficient than the musical instrument or whistle type, which would scarcely be audible under the best conditions.

C. J. L'ESTRANGE MALONE and D. H. THOMSON.

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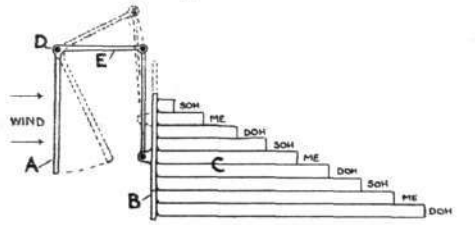
[14] I beg to enclose idea for speed-alarm. As a special claim in my idea, I think that a definite note, such as *me* or *soh* (easily recognised) would be much more suitable than a siren or whistle without such a distinguishing feature.



The reference letters denote :—A, hinged *wind-shield.* B, *slide* covering pipes. C, *pipes*, bugle intervals, easily recognised. D, hinge to wind-shield. E, lever lifting slide.

Liverpool. A. SWEENEY.

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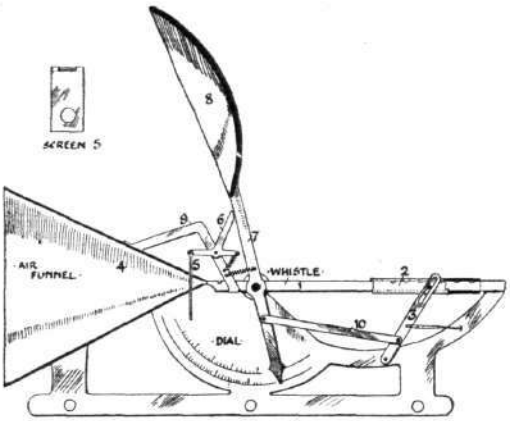
[15] In the accompanying sketch (1) is a brass whistle 18 ins. long, fitted with a brass sleeve (2) controlled by a fork (3) acting on a stud attached to the sleeve. A funnel (4) 1 ft. in diameter is



attached to the end of the whistle in order to collect the air. About 1 in. from the end of the whistle are two D-shaped guides fixed inside the funnel to accommodate a small screen (5) which passes through a slot in the funnel. The screen is controlled by an angle piece (6), attached to a light spring, and the setting of the angle-piece is governed by the air-pressure on a plate (8), attached to an arm (7). The arm (7) is connected by a rod (10) to a fork (3), so that the movement of the sleeve (2) is also controlled by the air pressure. The sleeve (2) uncovers holes in the whistle so as to change the note. The screen (5) is adjusted so as to prevent the whistle blowing at all below a certain speed.

T. LANCASTER.

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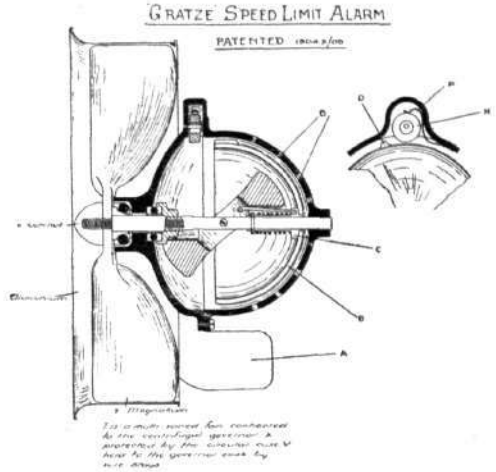
[16] In the accompanying sketch, T is a multivaned fan, operating the centrifugal governor, G, which actuates the gong, B. It will, therefore, be seen that when a certain speed is attained, the gong will be drawn down far enough to come into contact with the hammer, H, this hammer is held in position by the spring, P. The fan is enclosed in the protecting case, V, made of aluminium and held on to the spindle by the lock-nut, K. The indicating attachment is enclosed in an aluminium case attached to the thin case containing the governing mechanism and is composed of a steel cone, S, which is drawn along by the sliding-sleeve when the fan starts to turn. Pressing on the cone is a small polished cam, X, which terminates in the pointer, N, this pointer being held at zero by a spring and pivoted between the jewels, J. It will, therefore, be seen that according to the speed of the fan, the cone will compass a varying circumference of the cam, X, thereby causing the pointer to read off the speed in miles per hour on the equi-distant scale, M.



The whole mechanism is run on ball-bearings so that friction is reduced to a minimum, and if desired, the indicating mechanism or attachment may be fitted to the dashboard and connected by a thin steel wire enclosed in a tube to the governor.

Reference to the other letters are as follows :—

D is a raised cam on the gong which strikes the hammer, A is part of an adjustable bracket, O represents holes drilled in the containing case to allow the sound to come through.

Practically all of the parts of this apparatus are constructed from aluminium and magnalium, and the total weight, including the speed indicating apparatus, is approximately 2 lbs. 4 ozs.

E. V. GRATZE.

Further letters, accompanied by descriptions and drawings, for the Speed Alarm Competition are acknowledged from :—

O. D. Atkinson.	E. Rogers.	Robt. Grossart, Jun.
T. Lancaster.	J. H. Cardew.	H. Warrington.
David Hutton.	"H.R.A."	Dorrington & Thomas.
J. C. Thompson.	"Amateur."	C. B. Carden.
D. Langhame-Thornton	J. R. Turner.	Leslie Waggott.
D. G. O. Hiscox.	J. Gee.	J. H. Wilkins.
Harry Hewett.	J. M. Jepson.	F. B. Baggs.
G. Wells.	F. Williams.	C. A. Chappell.
S. D. Felkin.	J. W. Smith.	Harold Crombie.
K. G. Jobson.	M. W. Thompson.	W. Langdon-Davies.
John Russell.	A. E. Rutherford.	Wm. Tattersall.
J. S. Bell.	B. N. Kabli.	H. A. Hutt.
G. A. Chapman.	J. B. Wallace.	P. Crowsley.
A. H. Bailey.	F. C. Kent.	A. Tridon.
S. Silk.	Edgar Edwinson.	A. Chandler.
F. Webb.	W. Walden.	C. R. Taylor.

Flight Medals at Brussels.

IN the aeronautical section (Class 34) of the Brussels Exhibition the following awards are announced :—

Diploma of Honour.—Hans Renold, Ltd., Manchester.

Gold Medal.—"Harts," London.

Silver Medal.—North British Rubber Co., Ltd., Edinburgh.

A Sign of the Times.

As an indication of the widespread interest attaching to all aeronautical matters, a special course of twelve French lessons, introducing all technicalities in connection with aeroplanes, has been inaugurated by the Gouin School of Languages, 185, Oxford Street.

ROUND-ABOUT FRENCH NOTES.

By OISEAU.

I HAD hoped to be able to give a detailed description this week of the S.A.F.A. biplane designed and piloted by M. Rene Caudron, but the intervention of Fate, in the form of a gusty wind, has, by upsetting and smashing the machine during a practice flight, made my desire impossible for the moment. But as M. Caudron was only very slightly hurt, it is probable that a new machine will be finished and in the air in the course of the next few days. A general impression of the appearance of the machine can be obtained from the photograph published in last week's FLIGHT. It will be observed that the skids themselves form the lower main members of the fuselage, two small wheels under the main plane raising them sufficiently from the ground to add to the ease of starting. The control is the almost universal Farman type of a hand-lever operating both the gauchissement ailerons and the elevator, and a foot-bar for steering. An Anzani five-cylinder motor is fitted.

The few flights I saw M. Caudron make on the S.A.F.A. were all quite excellent, and were very much faster than any other biplane that I have yet seen. The impression one gained from watching fairly closely was of the extreme sensitiveness of the control, the slightest movement of the elevator or ailerons being responded to immediately. I must say, however, that one rather expected disaster after watching M. Caudron's very pronounced banking as he took the corners, with the added danger of flying too low at the curves. But with more experience his performances will no doubt greatly improve. It is certainly pleasing to see a machine of such promise and to realise that in no way is it a copy of any other specific type.

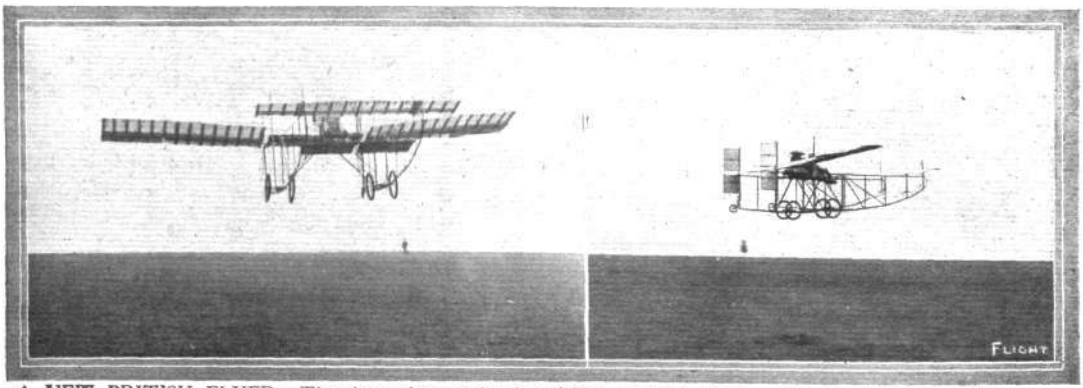
One sees from time to time articles in the English Press bemoaning the great expense of learning to fly—articles which are supported by letters from English aviators retailing their own expensive experiences whilst in the state of pupilage. One prominent aviator has stated in print that he spent a very large sum in learning the delicate art of imitating a tired albatross. I know as a positive fact that this gentleman spent no more than £1,100 before he received his pilot's certificate, and £1,000 of that is the price of his machine. What he has spent since in misplaced enthusiasm is of no importance at all. Other aviators have made similarly wild statements without any solid basis of fact. The truth is that for a total expenditure of £200 (excepting always the cost of living, which necessarily varies according to the idiosyncrasies of the individual and the state of his exchequer) anyone not totally incapable can be certain of obtaining his pilot's certificate. Almost all the great French constructors guarantee the brevet for £100, or even a little less, and £100 security for damage done. Once paid, the pupil's liability ends, and he is certain of a thoroughly good training. And at the present stage of aviation it can hardly be seriously argued that this price is not very moderate. The inflated bills of letter writers have, no doubt, reached their swollen total through adding to the true aviation account the cost of dinners at Maxim's, and other expensive amusements from which no monied youth appears capable of escaping in his passage through Paris. One advantage of learning before purchasing a machine is, that even the briefest experience will often completely alter one's views as to the most efficient type of aeroplane, and one does not find oneself saddled with an expensive machine which one does not wish to fly.

MM. Dufour and Colliex have been practising at Issy during the last week on a new two-seated double-control latest type Voisin. There are two control-wheels and two foot-bars, either series of which has complete command over the machine. The two aviators intend to enter for the Prix Michelin, a flight from Paris to the summit of the Puy de Dome. I remember Messrs. Humber exhibited at the last Aero Show a somewhat similarly-arranged biplane, but with three controls instead of two. Nothing, however, so far as I know, came of it in the end.

Superficially the double control has great attractions, but the slightest momentary disagreement might have distinctly unpleasant results. The minds of the two pilots ought to be attuned one to the other, for there are invariably several distinct and equally sound methods of doing the same things, and of them the two aviators must decide immediately on one and the same. Personally I would prefer to stay behind and watch. The risks seem too great.

The interest shown in the military progress of aviation continues to grow daily. The results at the manœuvres have quite sufficiently demonstrated the foresight and confidence of General Brun in founding so strong an aviation corps. Day by day the backward state of England in this line is emphasised more and more by the news from all quarters. The Germans, for instance—though on paper they have said nothing—have at their command an even greater number of aeroplanes for military purposes than France. They have not hesitated to make the most slavish copy of every successful French aeroplane; for instance, the "Aviatik" is the Farman, and the "Albatross" the Antoinette. Italy also has some ten machines in the possession of the army. And yet withal, England contents itself with criticisms, letters to *The Times*, and spasmodic attempts to prove a proposition proved over here months ago! To do credit to the *Daily Mail*, it is the only journal of the lay Press with sufficient foresight to insist daily on the formation of an aerial corps of some kind. England has the money and the men, and only the machines and the organisation are lacking. If some of the money spent daily in erecting statues to "little brown dogs" and defunct and tiresome mayors of quite unknown towns were to be devoted to the advancement of the new science, England might remove from itself the slur of being backward and unwilling to learn. Cannot the country realise the necessity, acting on the certainly sincere advice given by our present King some years back when he concluded a speech on the advancement of colonial enterprise with the words "Wake up, England!"?

My contention as to the very modified use of airships has I think been clearly proved in the French manœuvres, as in one official report the words appeared, "owing to the high wind the dirigible balloons were unable to leave their sheds, but three aeroplanes took an active part in the operations during about three hours."



A NEW BRITISH FLYER.—The above photographs show "Valkyrie I" in flight on Tuesday, September 13th, prior to dismantlement for removal to the new works and school that the Aeronautical Syndicate, Ltd., have established at Hendon. This machine is the fifth of a series of experimental models with which trials have been carried out on Salisbury Plain during the past 17 months. It is a monoplane, and is characterised by several interesting features both in design and construction. There is no tail, and the pilot sits in front of the engine, which is in front of the main planes; he thus has a clear outlook in every direction. In front of the pilot is a leading plane, beneath which is the elevator.

FLIGHT

STEERING BY COMPASS.

By L. GRAHAM DAVIES.

THE remarkable predicament in which Van den Born found himself on his return journey from Rheims to Chalons Camp, and again some incidents of the great London to Manchester flight, suggest an interesting problem for inventors to work upon.

In the near future there will be a great deal of cross-country flying done; not, of course, in all weathers, but often in misty weather.

Now at present, unless an aviator knows the country over which he is travelling, and knows, moreover, what that country looks like from above, there is no method by which he can ascertain the actual direction in which his machine may be moving; so that whether he arrives at his destination or not is more a matter of luck than anything else.

Steering by compass, except in perfectly calm weather, is almost useless, as the accompanying diagram, Fig. 1, will show. Suppose the aviator is starting out from a point, A, with the intention of reaching, B, a point to the north-east of him. Accordingly, he points the nose of his machine in what the compass shows him to be a north-easterly direction, and proceeds. There is, however, a slight wind blowing from the south-east, which carries him out of his course; but not knowing the country, or at all events not being accustomed to an "aeronaut's eye" view of it, he is unaware of this, and continues north-easting his aeroplane by the compass. Now it is at once obvious that, however long he may continue to steer in this way, he will never arrive at B, the actual movement of his machine being probably nearer due north than anything else.

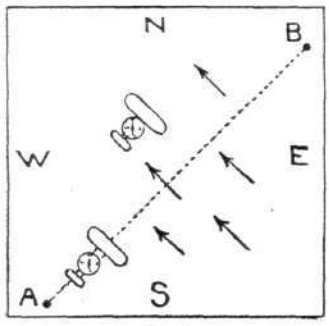


Fig. 1.

The effect of winds upon the course steered by an aeroplane is naturally very much less than their effect in the case of dirigible balloons, for not only is the resistance offered exceedingly small, but the independent speed of the machine is very much greater.

Aviators do not at present go up in winds blowing at much more than 20 or 25 miles per hour, whilst the speed of aeroplanes averages from 40 to 50 miles per hour.

But though an aeroplane may drift less than a dirigible, it still drifts, and this fact cannot be neglected.

Suppose again that the aviator does know the country quite well, and setting his course by various landmarks, when suddenly he passes over an area of low-lying haze or mist, a most ordinary occurrence in ballooning, as anyone familiar with the sport will agree. The landscape becoming blotted out, the aviator is instantly lost, he cannot determine his real horizontal movement in any direction.

With regard to the first of these cases, where the aeronaut is passing over unfamiliar country, but can see the ground clearly. In this instance, several methods of ascertaining the actual direction of movement would appear to be possible.

There is a certain little piece of apparatus in use on dirigible balloons, known as the Joanneton Speed Recorder. This appliance consists of a metal quadrant, on one face of which is engraved a table of heights and speeds; over this table moves a rule or pointer, which is geared to a small mirror projecting from the other side of the quadrant. By the aid of a small telescope which is fixed to the apparatus, the aeronaut sees in the mirror an image of some fixed object on the ground. By turning the mirror he follows this object for exactly one minute, keeping it all the time in the field of the telescope. The position of the sliding rule or pointer, with regard to the distance and altitude tables, will then give him the speed of his machine in miles per hour. Now it would seem that, if combined with a compass, this instrument might, by the placing of cross wires in the telescope, and keeping the mirror still, so that objects appeared to pass across the field of vision, be made to give also the direction of movement over the ground.

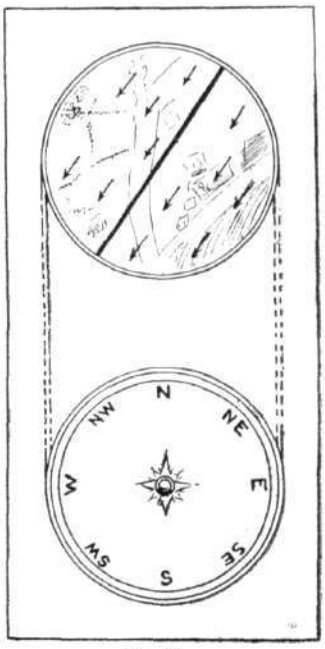


Fig. 2.

But in any case, this is essentially an appliance for passengers' use.

The driver of an aeroplane has all he can do to manage his machine, without peeping through little telescopes, twiddling mirrors, and reading scales.

An arrangement suggests itself to the writer by which the aeronaut himself, without taking his attention too much from the control of his machine, may yet quite easily ascertain his direction, so long as he can see the ground above which he is travelling. The appliance in question is shown in the diagram, Fig. 2. It consists of a circular glass plate, with a clearly marked line across it.

This plate can be made to revolve, and is connected by means of a small driving chain with the case of an ordinary card compass. The arrangement is placed in front of the aviator in such a position that, by looking through the glass plate, he can see any objects on the ground over which he may be passing. The red line upon the glass corresponds to the "lubber point" of an ordinary card compass, and if the plate is rotated until objects on the ground appear to be passing under the aeroplane, directly parallel to this line, then a glance at

the compass, the case of which, as it has already been stated, is connected to the plate, will instantly show the aviator in what direction he is travelling.

When we come to the case of a flying-machine travelling over mist or fog, however, the difficulties are much more serious. Indeed, at present the problem would appear to be almost incapable of solution. A gyroscopic compass has been used with some success in the Navy, for directing the course of submarines when completely immersed; and it is conceivable that this appliance might be adapted for use upon aeroplanes. It is, however, a very delicate and costly apparatus, the price running into several hundreds of pounds, and one therefore which is not likely to come into general use; not to mention the fact that its mechanism is at present a Government secret.

FROM THE BRITISH FLYING GROUNDS.

New Forest Aviation School (Beaulieu).

THE New Forest Aviation School, which practically commenced operations after the Bournemouth International Meeting, has been making steady progress, and at present is going along at full swing.

Major Cooke, R.A., and M. Poggioli have both managed some short flights in a straight line, and Messrs B. H. Barrington Kennett (Grenadier Guards), A. Aitken, and St. Croix Johnstone (Chicago), are "rolling" whenever the weather is suitable, which has been the case almost daily for the past fortnight.

Mr. Drexel and Mr. McArdle, the principals, have been in constant attendance since their return from Leopardstown, and the former frequently takes pupils up on the double-seater Blériot for instruction in rising, control in the air, and landing.

Mr. McArdle successfully tried a pair of half-racing wings on a single-seater last Sunday before quite a large crowd of spectators, who turn up from all parts of the countryside regularly every evening to watch anything that takes place, and evince the deepest interest in all attaching to the school.

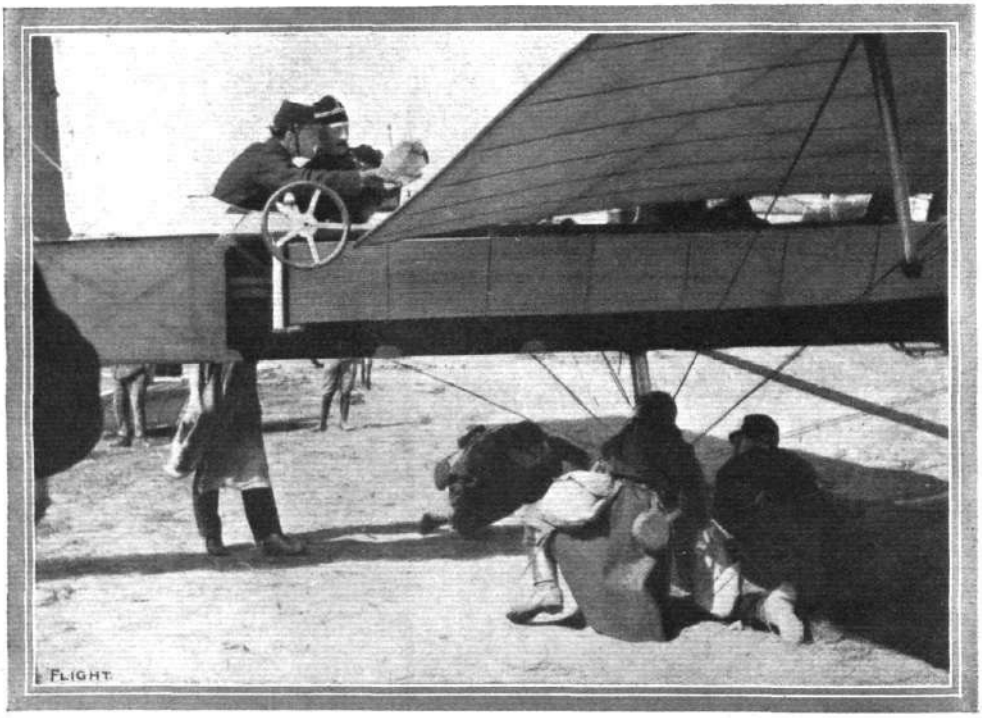
H.S.H. Princess Louis of Battenberg motored to the ground on three successive days recently.

Lord Montagu of Beaulieu paid a long visit immediately upon his return from the Continent last week, and on Wednesday several Royal Marine Artillerymen, who are encamped two miles away, were brought up by their commanding officer and then taken round the sheds, where the machines were fully explained, to their evident interest.

Mr. Drexel has taken up some twenty persons in the double-seater lately, exclusive of pupils, amongst others Mrs. W. E. McArdle, who had a long trip, ascending to over 600 ft., and being delighted with her experience.

There are now ten machines in the hangars, and there seems every probability that this number will soon be increased, as new pupils are arriving each week and several more are expected shortly.

Mr. Harry Delacombe has recently been appointed manager of the school. He has visited nearly all the foreign schools, meetings, &c., and has a pretty general knowledge of what is required.



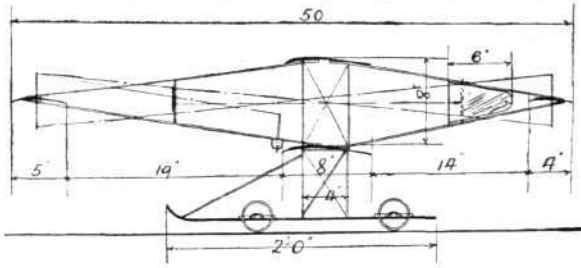
AN INCIDENT DURING THE FRENCH ARMY MANŒUVRES.—M. Latham, just about to start on his Antoinette for a scouting expedition with a French officer, taking instructions as to the work to be carried out. Note the military assistants holding down the impatient flyer.

FLIGHT

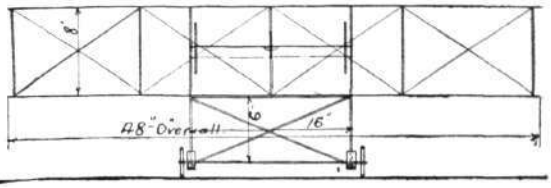
A MODEL BIPLANE FOR 5s.

By HENRY W. DUNN.

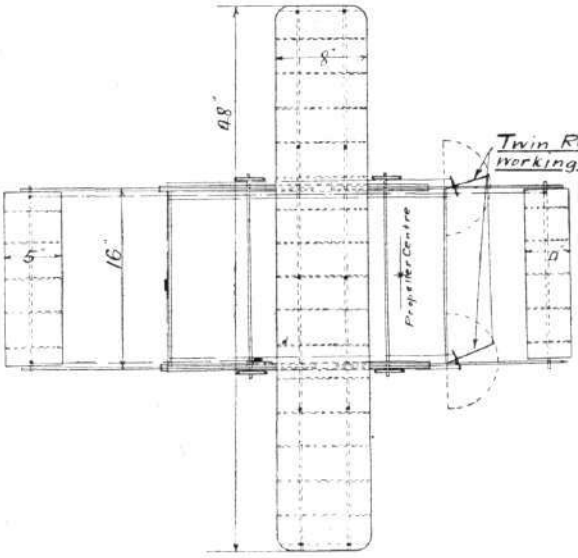
THE following are particulars of my latest model biplane, No. 5, of which the total cost was only 5s. I cut the wood out of board with a fretsaw, which is by far the cheapest way, and is, I consider, one of the pleasures of model making. The wood used is birch, and most of it has a square section of $\frac{1}{16}$ in. side. All the sharp edges are sand-papered off, and the finished spars are varnished all over.



— Side Elevation. —



— Front Elevation. —

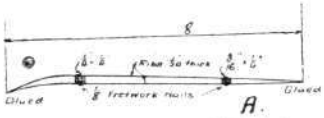


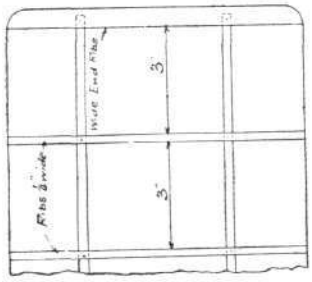
— Nº 5 Biplane. —

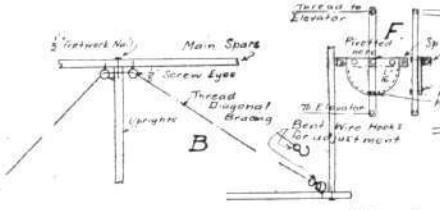
— Scale 1½ = 1 foot. —

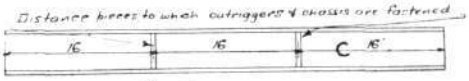
Main Planes	48"x8"
Elev "	16"x5"
Tail "	16"x4"
Length overall	50"
Back Outriggers	19½" long before bending.
Front "	25½" " " "
Skids (3 ply Wood).	24" "

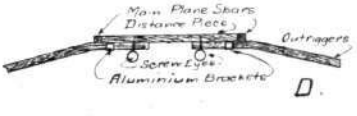
Tail & Elev. Planes connected & worked together.

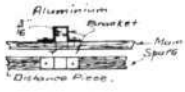












Details of Nº 5 Biplane.

Mercerised lawn, sized and varnished, is employed for the surfaces, and makes a light, strong, covering.

The joints are very simple, and if braced as shown at B, are very strong. The ribs are pinned to the main plane spars by $\frac{1}{8}$-in. fretwork pins, as shown at A, and are glued together back and front. The best way of cambering the ribs is to cut a piece of wood $8\frac{1}{2}$ ins. wide and then bend it in the piece, which ensures all the ribs having the same curvature. The ribs are of $\frac{1}{16}$ in. spruce, and the planes are all doubled surfaced.

I desired to make this machine dismountable, for which reason the chassis is secured to the planes by four screw eyes screwed to the distance pieces as shown at C. The outriggers slide in the aluminium brackets and are then secured by a screw eye to the distance piece as shown at D. The wheels I took off a toy clockwork motor, and they are fastened to the skids by rubber bands.

The elevator and tail planes are interconnected and work in unison by the operation of a lever. The rudders also work together from a lever as shown at F. Both the elevator and the tail plane spars are carefully rounded at each end to form journals, so that they may be carried direct to the bearing at the end of the outriggers.

Strong thread is used for bracing, being much better than wire, as it does not stretch so easily. Fretwork nails (half-inch) and screw eyes with $\frac{3}{8}$ in. diameter holes are used for the joints, while screw eyes, with $\frac{1}{8}$ in. diameter holes, are employed for the bracing. My preference for screw eyes was because they have such a fine thread and are so easy to handle.

Mercerised lawn is also used for covering the rudder, which is constructed and mounted as shown at E.

The elastic motor is not shown, but it is made to take in and out easily; it drives a 15-in. wooden propeller. When taken apart the model consists of five pieces: (1) main planes, (2 and 3) outriggers, (4) chassis, (5) motor and propeller. It can be assembled in 30 minutes. The cost of the model is made up as follows: fabric, $2\frac{1}{2}$ yards at $4\frac{1}{2}d.$, 1s.; elastic, 12 yards, 10*d.*; screws eyes, 2 dozen, 6*d.*; ball-bearing thrust for propeller, 6*d.*; wheel, 6*d.*; size and varnish, 6*d.*; wood, 8*d.*; nails, screws, and thread, 6*d.*; Total, 5s.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

Committee Meeting.

A MEETING of the Committee was held on Tuesday, the 20th inst., when there were present:—Mr. C. F. Pollock (in the Chair), Mr. Griffith Brewer, Mr. Ernest C. Bucknall, Col. Henry C. L. Holden, R.A., F.R.S., Mr. F. K. McClean, Mr. J. T. C. Moore-Brabazon, Mr. Stanley Spooner, and Harold E. Perrin, Secretary.

New Members.—The following new members were elected:—

Capt. W. S. Brancker, R.F.A. Maj. A. W. Hewetson, R.F.A.
James W. Grace. Richard Francis Ernest Wickham.

Aviators' Certificates.—The following aviators' Certificates were granted:—

20. R. Wickham.
21. F. K. McClean.

New Regulation affecting Aviators' Certificates.—The Royal Aero Club, as the recognised authority and representing the Federation Aeronautique Internationale in this country, having set up the necessary organisation and machinery for examining aviators and granting certificates to those who are duly qualified, and in view of the danger to the public owing to unqualified aviators taking part in exhibition flights, has unanimously adopted the following Regulation:—

"Any aviator taking part in a public exhibition of flying without having obtained an aviator's certificate will render himself liable to have the granting of his certificate postponed for such period as the Committee of the Royal Aero Club may determine."

Disqualifications Pronounced by the Aero Club de France.—A letter from the Federation Aeronautique Internationale was read conveying the following disqualifications pronounced by the Aero Club de France in connection with the Croix d'Hins Aviation Meeting held on August 20th, 1910, which meeting had not been sanctioned by them.

Messrs. Roger and Bickat, organisers of the meeting, have been suspended for 16 months terminating December 31st, 1911.

Messrs. Lesire and Vallon, aviators taking part in the meeting, have been suspended for one month terminating September 30th, 1910.

Conference of the Federation Aeronautique Internationale.

The Conference of the Federation Aeronautique Internationale will take place in Paris towards the end of October. The Royal Aero Club are entitled to 12 votes. A meeting of the General Committee of the Royal Aero Club, which consists of the Committee of the Royal Aero Club and representatives of Associated Clubs, will be held at 166, Piccadilly, London, W., on Tuesday, October 4th, 1910, at 4 p.m. at which the questions to be brought up at the Conference of the Federation will be considered and delegates appointed.

The following clubs are associated with the Royal Aero Club:—

Scottish Aeronautical Society.
Bristol and West of England Aero Club.
East Riding Aero Club.
Manchester Aero Club.
Northumberland and Durham Aero Club.

Rolls Memorial Fund.

Members who have not yet sent in their contributions to the above Fund are requested to do so as early as possible. By limiting individual subscriptions to the sum of 10s. the Committee hope they will receive the support of all members.

It has been decided that the Memorial shall take the form of a bas-relief plaque, and that any surplus over and above the cost of the Memorial shall be devoted to the establishment of an **Aeronautical Library** at the **Royal Aero Club**, to be called the **"Rolls Memorial Library."**

Contributions of books to the **"Rolls Memorial Library"** will also be greatly appreciated.

A list of subscriptions received up to September 14th was published in the last issue, and the following have since contributed up to September 21st:—

F. H. L. Anstruther.
Sydney D. Begbie.
Prof. C. Vernon Boys.
Arthur M. Burberry.
S. Bushell.
R. W. Buttemer, M.A., F.C.S.
D. Cory-Wright.
Sherard Cowper-Coles.
Miss V. Fitz-George.
Dr. Arvid Kellgren.
H. Latham.
P. Kent Le May.
Field-Marshal Earl Roberts.
F. Scully.
Capt. H. C. Simpson, R.F.A.
Lieut. H. Spencer-Cooper, R.N.
J. W. F. Tranmer.
B. Travers.
Col. F. C. Trollope.
Henry H. Walford.
W. H. Willcox.

Aviators' Certificates

Granted by the Royal Aero Club of the United Kingdom.

1. J. T. C. Moore-Brabazon	1910. 8th March	11. Hon. Maurice Egerton	14th June
2. Hon. C. S. Rolls	8th March	12. James Radley	14th June
3. A. Rawlinson	5th April	13. Hon. Alan Boyle	14th June
4. Cecil Grace	12th April	14. J. Armstrong Drexel	21st June
5. G. B. Cockburn	26th April	15. G. C. Colmore	21st June
6. Claude Grahame-White	26th April	16. G. A. Barnes	21st June
7. A. Ogilvie	24th May	17. Capt. Geo. Dawes	26th July
8. A. M. Singer	31st May	18. A. V. Roe	26th July
9. S. F. Cody	7th June	19. A. E. George	6th Sept.
10. Lieut. L. D. L. Gibbs, R.F.A.	7th June	20. R. Wickham	20th Sept.
		21. F. K. McClean	20th Sept.

Eastchurch Flying Ground.

Many members visited the flying ground last week-end and witnessed flights by Mr. Cecil Grace, Prof. A. K. Huntington, Mr. F. K. McClean, Mr. Jack Dare, and Mr. L. Jezzi.

Shed Accommodation.—The two sheds belonging to the Royal Aero Club have now been removed from Shellbeach to Eastchurch and are available for members. Full particulars can be had on application to the Secretary.

HAROLD E. PERRIN,
Secretary.

166, Piccadilly.

PROGRESS OF FLIGHT ABOUT THE COUNTRY.

(NOTE.—Addresses, temporary or permanent, follow in each case the names of the clubs, where communications of our readers can be addressed direct to the Secretary. We would ask Club Secretaries in future to see that the notes regarding their Clubs reach the Editor of FLIGHT, 44, St. Martin's Lane, London, W.C., by first post Tuesday at latest.)

A Model Club at Brockley.

A SIXTEEN-YEAR-OLD reader, Mr. B. Gurney, of 30, Arica Road, Brockley, writes to enquire whether there is a model aeroplane club at Brockley, and, if not, whether it would be possible to start such a club in the district. If there are any other model-makers in the district perhaps they will arrange a meeting and discuss the proposition.

A Model Aeroplane Club at Truro.

WITH the object of forming a model aeroplane club for Truro, a number of persons interested recently met at Thomas' Restaurant, Truro, and decided to proceed with the formation of such a club. Mr. J. Holdsworth, who has made some large models fitted with petrol engines, was elected chairman, and he promised to read a paper on model construction, and also to present a model for the best constructed 12-in. propeller. A club room and a workshop have been secured, and the Hon. Sec., Mr. C. F. W. Rendle, 6, Agar Road, Truro, will be glad to receive donations of books, papers, or anything connected with aviation. It is hoped to arrange some competitions for next month.

Birmingham Aero Club (165, HAMPTON STREET).

THE competition for the amateur championship of the Midlands (1910) was carried through on the 17th at King's Heath. The weather was perfect, and the ground, though somewhat distant from any trams, was entirely free from trees and obstacles for nearly half a mile in any direction. There was a good attendance, and in the opinion of some competent judges, the model flying was a long way the best yet seen. Practically Mr. E. E. Noble carried all before him. Strong competitors like Mason, Smith, and Haynes, with 39, 38, and 36 secs. were entirely out of it. With his dilapidated looking 4 oz. monoplane Noble secured the championship, 48 secs., the prize for height (flown in heats, four models at the time), and the prize for longest distance, 149 yards. All models showed an irritating desire to return to the starting point before dropping. In the last event Mr. C. E. Turner (39 secs.) beat Noble by 2 secs. The latter was then flying an 11-ouncer. Undoubtedly, from the spectator's point of view, models being flown two, three, or four at a time is vastly more interesting than singly, and with proper judging the competitors' chances are in no way prejudiced.

The judging was undertaken by Dr. Ratcliffe, F.R.S., and Mr. Davis, assisted by Messrs. Beeby and Brazier. The times made were very carefully checked by O. Leeson's motor-racing stop watches.

On October 8th the club is offering a cash prize of £5 to the owner of a model flying across the Edgbaston Reservoir. The distance from bank to bank at the point chosen is 130 yards. The event is open to all. Entrance fees, professionals, 5*s.*; non-members of the B.Ae. Club 2*s.* 6*d.*; members 6*d.* An unlimited number of models can be entered without extra charge. Entries close October 3rd. Late entrants must pay double fees. All enquiries must be accompanied by stamp.

Conisborough and District Model Ae. Soc. (18, CHURCH ST.).

IT has been decided that entries for the forthcoming competitions, to be held on October 8th, shall close on October 5th.

There will be four competitions: 1. Longest flight; 2. Circular flight; 3. Landing nearest given spot; and 4. Stability. Entrance fee, 3*d.* members, 6*d.* non-members, for each model.

A special medal will be given to the member (under 17 years of age) making the best flight.

It has also been decided to buy materials for model making for sale to members; and the Secretary will be pleased to receive best terms from accessory dealers.

Devon and Cornwall Aero Club.

AT a meeting of the club held last week, the question of acquiring a flying machine was gone into. Mr. Mumford said he was prepared to place his monoplane at the disposal of the club provided they fitted a motor to it. It was decided to inquire as to the cost of a motor.

The question of a flying ground was also considered, and a deputation was appointed to inspect a ground at Roborough. The chairman, Mr. D. Jordan, expressed a hope that some local gentleman would offer a prize of, say, £100 for the first trial flight.

Kite and Model Aeroplane Assoc. (27, VICTORY RD., WIMBLEDON)

ARRANGEMENTS have been made to hold an altitude competition and display of kite flying on October 1st on Wimbledon Common at 2.30. Also there will be held on the same day an open kite flying competition for prizes given by Messrs. Brooke and Westhorp. 1st prize, Brookite, value 30*s.*; 2nd prize, Brookite, value 25*s.*; 3rd prize, Brookite, value 15*s.* Entries close Wednesday, September 28th. Free to members; non-members, entrance fee, 1*s.*

RULES.—1. Competitors may submit any kite, either home-made or manufactured.

2. Competitors must be at the judges' flag at 1.30 sharp. Any competitor not present at that time will be disqualified.

3. The competitors must have exactly 300 yards of line on winders, and the line or wire may be of any size or kind.

4. The judges will take the angle of kites when in flight.

5. Competitors must note that the competition will last 40 mins., and if the kite falls to the ground during that time it will be disqualified.

6. Classification will be made in the following manner:—Angle, stability, strength of construction and collapsibility. Maximum of marks is 40, *i.e.*,, 10 for each test.

Paddington and Districts Aero Club (2, EDBROOKE ROAD, W.).

THIS club is holding weekly meetings and would be glad to hear from intending members. The object of the club mainly is to further public interest in aviation and the support of same by providing its members with every facility for making models, gliders and full-size machines for exhibition and show purposes. To give public exhibitions of model flying, man lifters and kites, small balloons, &c. It provides competitions for its members and offers prizes, &c. Lady members are welcome. The club also has workshops and flying ground.

The entrance fees for the club are as follows: Senior Section (age over 15), 2*s.* 6*d.* entrance fee, 3*d.* per week; Junior Section (age under 15) 1*s.* 6*d.* entrance fee, 2*d.* per week. This takes in the full-size department for both. Further particulars from H. Hurlin, 2, Edbrooke Road, Harrow Road, Paddington.

Scottish Aeronaut. Soc. Model Ae.C. (3, STANMORE RD., GLASGOW)

AT a joint meeting of the Scottish Aeronautical Society (Model Section) and the Glasgow Model Aero Club held on July 15th, it was decided that these two bodies should amalgamate for the good of aviation generally, and that the new club be known from that date as the Scottish Aeronautical Society Model Aero Club.

At the inauguration meeting held on August 25th, office-bearers were appointed and rules drawn up and approved of.

A flying competition will be held early in October, when some valuable prizes will be offered both in the open and closed events.

Further information can be had from the hon. secretary at the above address, who will be pleased to forward club prospectus and competition entry forms.

Sheffield & District Ae.C. (22, MOUNT PLEASANT RD., SHARROW)

MEMBERS had some splendid sport on the afternoon of the 3rd inst. Some highly-successful gliding was witnessed, in which all those members who were present took part, including some ladies.

A model competition was also held, for which medals were awarded.

The longest flight of the day proved to be 610 ft. by Mr. C. W. Cotterell, with a monoplane of his own construction.

Other good flights were Mr. Oliver (480 ft.) and Mr. Knowles (237 ft.).

After the competition, Mr. Cotterell scored by sending his model high over the trees and across a neighbouring field—a flight of approximately 1,000 ft.

At the general meeting held on the 7th inst. it was decided to hold another model flying meeting on October 1st, in conjunction with the glider practice.

A large number of new members were elected.

A vote of thanks was passed to Mr. Patrick Alexander for his great assistance during the British Association visit.

The next general meeting is Wednesday, September 21st, at Builders' Exchange, 8 p.m., when members are asked to attend.

Southsea Aero Club (2, SHIRLEY ROAD, SOUTHSEA).

A NEW aero club has now been formed at Southsea. It is at present working very quietly, but great hopes have been expressed for the future. The Southsea Aero Club, as it is called, was formed on August 31st, and, thanks to the generosity of its members, already boasts of a small library.

BRITISH NOTES OF THE WEEK.

Irish Meeting Yields a Profit.

IT is extremely satisfactory to note (officially) that it will not be necessary to call upon the guarantors for any payment in connection with the Irish Aviation Meeting at Leopardstown, and that, in fact, there will be a small profit. This result reflects great credit upon the organisers and upon all those who so willingly and ungrudgingly rendered honorary service in order to make the meeting a success.

The Aftermath of Lanark.

AT the last monthly meeting of the Lanark Town Council, the question of compensation for the "trees" which were cut down to release Champel's and Kuller's machines was considered. It was decided that, as the trees were thirteen years old, to charge 2*s.* 6*d.* each, and as 270 were cut down a claim for £33 15*s.* was sent to the Aviation Committee.

Trials with Monoplane at Rothesay.

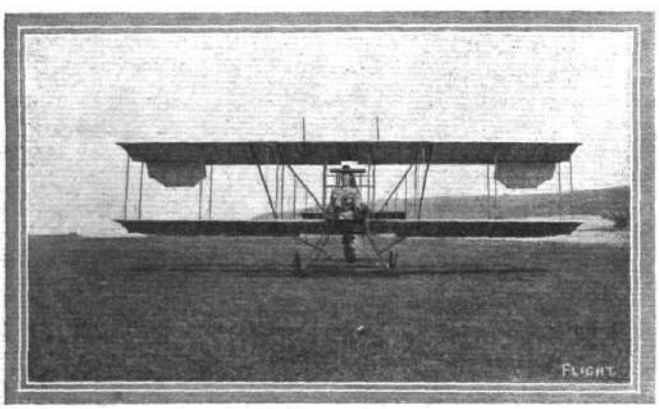
LAST week the monoplane which has been built by Mr. A. B. Baird and Mr. E. B. Steven, at Rothesay, was taken out for trial at Ettrick Bay. With Mr. Baird acting as pilot, the monoplane made a trial, but exhibited a tendency to swerve to the left. On the elevator being operated the machine rose in the air, but made a sudden turn to the right and fell, sustaining some slight damage.

Recovery of the Hon. Alan Boyle.

ALL interested in British aviation will be glad to learn that the Hon. Alan Boyle has so far recovered from the effects of his accident at Bournemouth as to make the journey from Bournemouth to Kelburn, accompanied by his mother, the Countess of Glasgow. He is making steady progress towards recovery, although it will still be a good while before he is completely himself again.

Success of the Havilland Aeroplane.

FOLLOWING upon the wrecked machine described by us in April 9th and 16th last, Mr. G. de Havilland has lost no time in building a fresh biplane fitted with his own engine (*see* FLIGHT, May 21st), and has this time met with success almost from the start. As the accompanying illustration shows, the new design follows close upon Sommer-Farman lines, while, in order to save time, a single propeller is this time used instead of the specially arranged pair with their bevel-wheel drive. Following upon a few preliminary hops prior to that day, a flight of about a quarter of a mile was accomplished a fortnight ago, the machine leaving the ground after running about 40 yards. Three times since then steadily improved trips have been made, and on Friday last ten or twelve flights of half a mile each—the full extent permitted, without turning, by the ground—were accomplished at heights varying from 20 to 50 ft. Apparently a lift is obtained in less than 40 yards, even when there is no wind, and although the run has to be made on a slight upgrade. Mr. Havilland is particularly pleased with the running of the engine, which seems to be able to do its work even with the throttle partly closed.



The De Havilland biplane.

Mr. Higginbotham's Slight Mishap.

REFERRING to the slight mishap at Freshfield last week, MR. G. Higginbotham writes as follows:—"The accident was caused after the machine had been running along the ground after landing from a flight of 3 miles, and had covered quite 100 yards when a piece of drift-wood caught the front wheel, buckling it, and causing the machine to cant over; but I was able to get out quite easily, and was not inconvenienced in the least. The breakages consisted of the propeller, one wing slightly damaged, and one wheel-rim buckled, so the accident was not nearly so serious as reported. I should like to take this opportunity to draw attention to the amount of anxiety inaccurate reports, especially in the daily Press, cause aviators through the anxiety of their relations and friends. Of course I do not wish to infer that no reports should be published at all, but at least a fairly true statement would remove much of the above feeling."

Training the Artillery.

VARIED success attended the tests which were made last week by batteries of the Royal Garrison Artillery and the Royal Field Artillery in firing at dummy aeroplanes and airships towed by H.M.S. "Adventure" off Plymouth, in Whitsand Bay. Although a good deal of valuable data was obtained, the gunners were not conspicuously successful in finding their marks, but doubtless the marksmanship will improve as time goes on. The dummy aeroplanes and airship were suspended in the air by means of large kites.

Metal Aeroplanes.

REFERRING to Mr. Moisant's forecast last week of metal aeroplanes in the future, Mr. G. Higginbotham writes as follows:—"I am looking forward with much interest to Mr. Moisant's steel-framed machine, as I built a cross-Channel Blériot entirely of steel tubing, and each time on landing the frame buckled to a great extent, being too rigid."

Tests with an Alvaston Engine.

FAILING to get satisfaction out of his old motor, Mr. Clayton has recently fitted a 30-h.p. Alvaston motor to his Blériot monoplane, and in a letter he says the experiment has been attended with the greatest success. With the tail elevated, but with the front wheels on the ground, half a mile was covered in 22 secs., while in a subsequent run the machine was off the ground in 20 yards. At the first attempt the Blériot rose to a height of 150 ft., and when the ignition was cut off the machine glided to earth and made a perfect landing. The engine gives off about twice as much power as the old one, while the weight is only 4 lbs. more.

Catalogue for Model Makers.

AMONG those who have a speciality of catering for the requirements of builders of model aeroplanes is Mr. A. Melcombe, of Castle Road, Bedford. A very useful catalogue has just been issued by this firm, and any of our readers who are interested in fittings for model aeroplanes would do well to send two stamps for a copy. Mr. Melcombe makes a speciality of propellers for models.

Bleriots in London.

VERY shortly the L. Blériot School of Aviation will be opened near London, and already arrangements have been made for several pupils to start learning immediately—the first to formally enter his name being Mr. Frank Hedges Butler. Mr. Chereau, M. Blériot's manager at 156, Regent Street, will be personally controlling all the details of the school.

In the meantime the firm has issued an exceedingly interesting little catalogue of the various monoplanes available, together with their prices, whilst in minute detail are given the cost of all the parts that go to make up a flying machine; truly a wonderful revelation to the uninitiated as to the firm commercial basis upon which the industry is already being conducted. Although hardly an appendage for an aviator to carry with him, the illustrations of the firm's standard "Box of Spare Parts from £80 to £120, According to Type of Monoplane," is very suggestive.

BRITISH AVIATION MEETINGS.

DONCASTER FLIGHT MEETING.—Aviators leaving London for Doncaster. From left to right—M. Beaud, Mdlle. Dutrieu, MM. Paul de Lesseps, Mamet and Ladougne.

The Folkestone Meeting.

SPLENDID weather obtained on Monday, the opening day of the flying meeting on the Folkestone racecourse at Westenhanger, and the large number of spectators who assembled had plenty to see. Proceedings were opened by Mr. G. A. Barnes, but it was some time before he got going properly, owing, it was afterwards found, to some dirt having choked the petrol feed-pipe. He however made a complete round of the course, covering about a mile and a half, and rising to a height of 90 ft. The next to take the air was Moisant on his two-seater Blériot, with which he made the journey from Paris to London. He remained in the air for 23 minutes, during which he covered about 20 miles, circling round the course ten times, but making wide sweeps over the adjoining country. Barnes, on the Humber monoplane, then went up again, this time covering a distance of 2 miles.

The most spectacular flight of the day was one by Grace. Mounted on the Blériot which was used by Drexel at Lanark, the very expert flyer mounted until he was a mere speck in the sky, at a height of 3,000 ft. He then returned to earth in a long gliding flight, landing gracefully after being aloft for 25 mins. The landing gave Mr. Grace a splendid opportunity of demonstrating the control of the machine. When within a few feet of the earth, a number of people rushed to the spot where he had intended to land, and in order to avoid an accident he was compelled to restart the engine and rise again and select a clear landing-place.

A high wind on Tuesday prevented any flying until late in the day, and it was not before 5 o'clock that Moisant ventured up. His first attempt ended after a quarter of a mile had been covered, but in the second trip he kept on for 9 minutes, during which he was severely buffeted by the cross-currents. Very shortly after he had come to rest, Mr. Grace took a turn, quickly rising to a height of 3,500 ft. While he was still up Moisant followed in his track, the two monoplanes making an impressive spectacle against the setting sun.

Doncaster Flying Week.

IN striking contrast to the success at Folkestone, the flying week at Doncaster opened on Monday in wet and windy weather, and to make matters worse, although the seven aviators were present, only one machine had turned up. This was Ladougne's Goupy, and this pilot made two flights, the first of 3 mins., while the second lasted for 12 mins. As there was practically nothing to see, the public were admitted to the aerodrome free.

Windy weather prevented any flying until late in the afternoon of Tuesday, when Ladougne opened the proceedings with a six-lap trip in 10 mins. 4 secs. He was followed by Paul de Lesseps, whose Blériot had arrived overnight. He preferred not to stick to the course, and rising to a height of 1,000 ft. went off in the direction of the town, passing over Barlby and returning to the aerodrome after an excursion which had lasted 12 mins. Ladougne then made several short trials, and wound up the day's proceedings by flying over Wheatley, a suburb of Doncaster.

A Record in Balloon Ascents.

MR. C. F. POLLOCK can, as an amateur aeronaut, we think claim at least the British record in balloon ascents by his trip on Saturday last from Battersea to Wokingham, this being his two hundredth ascent. In this total no less a number than thirteen English Channel and one Irish Channel crossings are included; a record we understand which is double the number of crossings over water which have been made by any other aeronaut, either of this or any other country.

An Abandoned Model Competition.

WE learn from the Central Novelty Co., of 99, Snow Hill, Birmingham, that the competition organised by them for model aeroplanes has had to be abandoned owing to lack of entries.

FOREIGN AVIATION NEWS.

Protection for Airmen.

IN connection with the conference of the British, French, and Belgian Aerial Leagues, held at Boulogne, on Saturday last, one or two inventors exhibited safety appliances for aviators. One of these was a floating jacket—the very practical invention of Mr. H. H. Reed, of Falmouth—another was a padded suit, the merits of which the inventor demonstrated by throwing himself against a wall, while a third appliance was a parachute which was to carry the pilot out of the machine in the event of anything going wrong with it.

Newcomers at Issy.

ON Monday successful trials were made with two new monoplanes at Issy. One—the Bonnet-Labranche—has already given such good results in private tests that a school is to be opened at which the pupils include a lady, Mdlle. Bacigalupo. The other monoplane is the Thomann, which made four circuits of the ground.

Doings at Mourmelon.

AT the Voisin School on Monday evening. Sée, on his Voisin, flew for 1 hr. 20 mins., mostly over the country, and landing at Vitry in order to replenish his petrol. In the morning he flew for 1 hr. 10 secs.

A fine flight was made by Train on the monoplane of his own design on Sunday, when he was aloft for 1 hr. 28 mins., passing over the country round Chalons Camp, his altitude mostly being about 200 metres.

At the Farman School at Buoy on the 16th, London flew for over an hour at a height of between 250 and 300 metres.

A Two-Seated Voisin at Issy.

DURING last week extended trials were carried out at Issy, with a new two-seated Voisin biplane, on the Issy parade ground. Colliex is in charge of the machine, and he has succeeded in making several very satisfactory flights. This is referred to in "Round About French Notes," p. 782.

Fabre Hydro-Aeroplane Flies.

LAST Saturday the Fabre hydro-aeroplane was given another trial at Martignic, and, piloted by Marius Burdin, it rose in the air to a height of between 5 and 6 metres and traversed a distance of a little more than 3 kiloms.

A High Flight by J. de Lesseps.

ON Friday of last week, at Issy, M. Jacques de Lesseps made an attempt to beat the altitude record, but was compelled to descend when he had reached a height of 2,170 metres.

A Parisian Municipal Prize.

THE Municipal Council of Paris have decided to offer a prize of 25,000 francs to the first French aviator who, starting from the French capital, lands in Brussels. The attempt is to be made between to-morrow (Sunday) and Tuesday next.

De Baeder Quite Well Again.

HIS many friends will be glad to hear that M. de Baeder has completely recovered from the injuries sustained in his recent accident, and he has announced that as all his life has been given to sport he cannot change now and he intends to continue flying.

The Trans-Alpine Contest.

OF the ten aviators who had entered their names to take part in the race over the Alps from Brigue to Milan, two of the elect—Chavez with a Blériot, and Weymann with a Farman—were at the starting place on Monday morning with every intention of setting out on their journey. Unfortunately the weather was not propitious, and at the time of going to press the aviators are still waiting for more favourable conditions. By way of compensation, however, several interesting flights have been seen by the many sportsmen who are gathered to witness the commencement of this historic trip. In the early hours of Monday morning, Chavez, in the course of a 12-min. trip, rose to a height of 2,000 metres, and tried to start on his journey through the Simplon Pass, but he found the wind eddies so disconcerting that he returned to the starting place. Later in the day he made another attempt, but with no better result, and Weymann also made an essay, but quickly returned to earth.

Heavy rains on Tuesday morning precluded any attempt at flight, but later in the day the conditions improved, and an exhibition flight was given by Taddeoli in his biplane. He reported very gusty winds above the valley, and said he had found the conditions exceedingly trying. In the twilight Weymann went for a couple of very short trips just to test the repairs he had made to his machine. Another competitor arrived in the person of Wienczіers, who ordered his Antoinette to be got ready as quickly as possible, and spent Tuesday in inspecting the course in a motor car.

LATEST FRENCH WEAPON AGAINST AIRCRAFT.—This motor gun-carriage was tested in practice at the French Army Picardy Manœuvres.

A Hanriot at Boulogne.

MOUNTED on his Hanriot monoplane, Henry Gournay left Boulogne on the 14th to fly to Wimereux. He flew ten minutes over the sea, but when passing the Creche cliffs on his way back the wind upset the machine, which fell on to the rocks, breaking the propeller and damaging the landing chassis.

Who Damaged the Oats?

A CURIOUS action has been brought against Mr. Maurice Farman in the Civil Court at Versailles, a farmer having lodged a complaint that owing to the aeroplanes from the School passing close over the fields, the oats and wheat have failed to give the harvest which their early growth promised. It is alleged as a result of observations taken that the aeroplanes cause a draught which flattens the corn to the ground, and so prevents its development. It will be interesting to learn the decision in this action.

Flying at Wiener Neustadt.

GOOD progress was made on the opening day of the flying meeting at Wiener Neustadt, which was attended by the Emperor Francis Joseph, the Archduke Leopold-Salvator, Don Jaime de Bourbon, and many other prominent personages. The height prize was won by Warchalowsky with 460 metres, while Illner took the duration prize with 31 mins. 28 secs. Four competed in the cross-country trip from Wiener to Neukeicher and back, a distance of 32 kiloms. The winner was Illner, with 23 mins. 3 secs., Warchalowsky being second, 23 mins. 37 secs.; Stohaugh, on a Voisin, third in 28 mins. 36 secs.; and Flesc, also on a Voisin, fourth in 31 mins. 10 secs.

Prizes for Berlin Meeting.

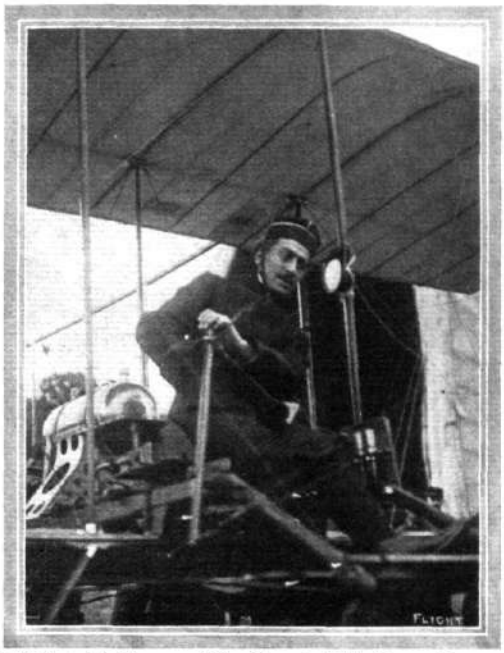
IT is now reported that Count Zeppelin has withdrawn his £500 prize, announced last week, but by way of a counterblast to this, the £750 specified by the German Minister of War has been subscribed by an anonymous donor.

Race from Treves to Metz.

THE German Association of Aviators is now busy organising a race, to be held next month, from Treves to Metz, a distance of 110 kiloms. The result will be decided according to the time taken and the altitude attained by the various competitors. So far six entries have been received, including three Wrights, of Engelhardt, Theler and Von Mossuer, an "Aviatik" by Jeannin, and an "Euler" by Haas.

A New Italian Record.

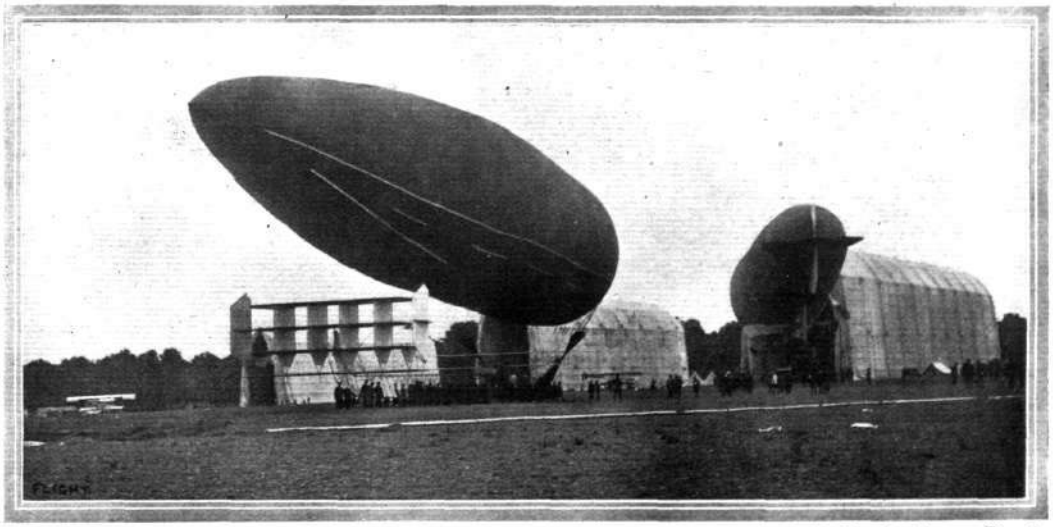
LEONINO DU ZARA set up a new Italian cross-country record by flying from Padua Aerodrome over the Arre district on the 13th inst. He covered a distance of about 100 kiloms., and his height was about 500 metres.



Sub-Lieut. Paulhan on "Le Gypaete," his Henry Farman machine, during the French Army Manœuvres.—Owing to the accident to his right arm, it will be noted M. Paulhan has to use his left hand for working his levers.

Flying Over Rome.

AN unusual sight was witnessed by the inhabitants of Rome on the 14th inst., when they were surprised to see an aeroplane flying over the Eternal City. It proved to be Lieut. Savoia on his Farman biplane, who had started from Centocelle early in the morning and returned there safely after making a wide circuit over the city.



"Bayard-Clement" and "Liberte" Airships at Briot-Aviation outside their sheds during the French Army Picardy Manœuvres. Note the steering and elevating box-planes of "Bayard-Clement," and in the distance one of the Army Henry Farman biplanes outside the aeroplane sheds.

THE BORDEAUX MEETING.

LAST week we were able to give the results at the Bordeaux meeting up to the end of the second day, when the monoplanes had it all their own way, Thomas, on his Antoinette, leading for duration, and Morane, on his Blériot, for height. This tale was continued on Tuesday, the 13th, when the "first to start" prize again fell to Audemars, on his Demoiselle, with Parent, on the Poulain-Orange machine, taking the second prize. During the afternoon there were a round dozen of aviators in the air, the distances flown ranging from the 4 kiloms. of Van den Born to 262 kiloms. by Thomas. This latter was not, however, accomplished in one flight, the longest single flight being Bielovucie's 125 kiloms. Kuller, on his Antoinette, was very busy, and totalled to 230 kiloms., while Bielovucie traversed 217 kiloms. altogether. Morane scooped up both the height and the speed prizes, the former with an altitude of 1,470 metres and the latter by covering 10 kiloms. in 6 mins. 54⅘ secs.

On Wednesday Audemars was once more the first in the air, followed by Bregi. The outstanding performance of the afternoon was a long flight by Simon, who did not stop until he had covered 280 kiloms. Apart from this there were exciting incidents when Mumm, Parent, Audemars and Mollien came to grief. Mumm had a sudden fall from a height of 200 metres, but marvellous to relate, although his machine was broken to splinters, he escaped unhurt. Morane again secured the height and speed prizes by rising to a height of 1,040 metres, and by covering the 10 kiloms. in 6 mins. 41⅕ secs. In the totalisation for distance Thomas added 322 kiloms. to his score, while Kuller put on 287 kiloms. A feature of the afternoon was the cross-country trip to Arcachon, which was accomplished by Morane in 59 mins. 43⅗ secs. In the passenger-carrying competitions Bregi completed 25 kiloms. in 25 mins. 7 secs., while Van den Born took 34 mins. for the same distance.

Thursday saw quite a lot of high flying, Tyck and Legagneux, both on Blériots, getting up well over a thousand metres, although they failed to surpass Morane, whose daily record was 1,950 metres, whereas Tyck's best was 1,370 metres and Legagneux's 1,330 metres. Two other good flights were those of Bregi (Voisin), 900 metres, and Gibert (Blériot), 800 metres. Four competitors "toed the line" for the opening competition of the day, and this time Kuller secured the first prize for the first flight, while Martinet took the second prize. The longest journey of the day was that of Aubrun, who covered 230 kiloms. in 2h. 48m. 52s., while other long trips were 140 kiloms. by Thomas in 1h. 55m. 48⅘s., and 120 kiloms. by Simon in 1 hr. 32 mins. The speed prize was again secured by Morane, his time for the 10 kiloms. being 6 mins. 32⅘ secs.

Aubrun made a clean sweep of the long distance records on Friday in the course of a flight which did not end until 317 kiloms. had been covered. The first record to go was 30 kiloms., and thereafter by his performance the new records now stand at—

	h. m. s.		h. m. s.		h. m. s.
30 kils.	0 20 10	150 kils.	1 43 19⅗	300 kils.	3 33 7⅕
40 ,,	0 27 8⅕	200 ,,	2 18 18⅕	2 hours	107·5 kils.
50 ,,	0 34 3	250 ,,	2 56 58⅘	3 ,,	252·5 ,,

Morane also succeeded in bettering the record for 20 kiloms., reducing the time to 12 mins. 38⅘ secs. He also won the daily speed prize by a time for 10 kiloms. of 6 mins. 23⅗ secs.

The prize for the first to start during the day fell to Martinet, while Paul, on his Voisin, secured second prize. The daily honours for height went to Legagneux, who reached an altitude of 1,570 metres. The longest flight was Aubrun's, and the time for his 315 kiloms. was returned at 3h. 43m. 56⅘s. A feature of the afternoon's programme was the passenger-carrying competition among the military officers. Lieut. Byasson, on his Maurice Farman biplane, led at the end of the day, having covered 100 kiloms. in 1h. 30m. 34s. Lieut. Fequant, on his Henry Farman machine, was second, with 92·5 kiloms. in 1h. 47m. 54⅕s., Lieut. Cammermann third, with 90 kiloms., in 1h. 26m. 17s., and Lieut. Remy fourth, with 35 kiloms., in 40m. 15⅕s. This competition was continued on the following day, when the last-named officer made a flight of 110 kiloms. in 2h. 8m. 24s. A second cross-country contest from Bordeaux to Margaux and Libourne and back had been arranged for Saturday afternoon, and three competitors started. The winner turned up in Morane, who took 1h. 2m. 45⅖s. for the circuit, while Aubrun was second in 1h. 30m. 57⅗s.

The longest flight during the day was by Kuller, who also took the prize for the first in the air, and he covered 105 kiloms. in 1h. 22m. 59⅕s., but the most flying during the day was done by Thomas, who made his position as leader in the totalisation competition practically impregnable, as he was 500 kiloms. ahead of his nearest opponent, Kuller, and nearly twice that distance in advance of the next man, Simon. Height honours again went to Legagneux, this time with 1,240 metres, while by covering the course in 6 mins. 28⅘ secs. Morane again secured the speed prize. During the day there were nine competitors flying, and Mumm made his reappearance on his spare Antoinette.

The meeting came to an end on Sunday last, and during the afternoon the proceedings were graced by the presence of the President of the Republic, accompanied by the Ministers of Commerce, Justice, Public Works, Marine, and many other high Government officials. Audemars secured the prize for the first in the air, Kuller taking the second prize. The speed trials for the military aviators resulted in another win for Lieut. Remy, he covering the 25 kiloms. in 25 mins. 52⅘ secs., while Lieut. Chevreau was second, he taking 27 mins. 18⅘ secs. on the Wright machine. In the course of a long trip for the benefit of the President, Morane succeeded in bettering several intermediate records, as follows:—

	h. m. s.		h. m. s.		h. m. s.
60 kils.	0 39 32⅘	80 kils.	0 53 5	100 kils.	1 6 39⅘
70 ,,	0 46 19⅕	90 ,,	0 59 52⅗		

He landed after covering 122·5 kiloms. in 1h. 22m. 53⅕s.

During the morning Latham, arriving at the aerodrome and borrowing Verliac's Antoinette, made several spectacular flights, rising to a great height.

The following are the final prize results:—

Longest Distance in One Flight (10,000 and 5,000 frs.).

1. Aubrun (Blériot) ... 315 kils. | 2. Simon (Blériot) ... 280 kils.

Passenger Carrying (5,000 frs.).

1. Bielovucie (Voisin) ... ... 60 kils. in 1h. 2m. 1⅘s.

Altitude (10,000 and 5,000 frs.)

	metres.		metres.
1. Morane (Blériot)	... 2,100	2. Legagneux (Blériot)	... 1,520

Cumulative Height (12,000, 8,000, 5,000, 4,000 and 3,000 frs.).

	metres.		metres.
1. Morane (Blériot)	... 18,930	4. Bregi (Voisin)	... 9,085
2. Legagneux (Blériot)	... 14,902	5. Gibert (Blériot)	... 6,710
3. Tych (Blériot)	... 10,665		

Officers' Passenger Carrying Competition (7,000, 3,000, 1,000 and 1,000 frs.).

1. Remy (H. Farman) ... 110 kils. in 2h. 8m. 24s.
2. Fequant (H. Farman).
3. Chevreau (Wright).
4. Byasson (M. Farman).

Speed Prize (6,000 and 4,000 frs.).

1. Morane (Blériot) ... 25 kils. in 16 mins. 2⅘ secs.
2. Aubrun (Blériot) ... 25 kils. in 16 mins. 47⅕ secs.

Cumulative Distance (15,000, 7,000, 4,000, 2,000, 1,000 and 1,000 frs.).

	kils.		kils.
1. Thomas (Antoinette)	... 2,100	10. Ruchonnet (Antoinette)	252
2. Kuller (Antoinette)	.. 1,750	11. Parent (Poulain-Orange)	195
3. Simon (Blériot)	... 1,165	12. Legagneux (Blériot) ...	70
4. Aubrun (Blériot)	... 932	13. Van den Born (H. Farman)	55
5. Bielovucie (Voisin)	... 850	14. Paul (Voisin)	50
6. Morane (Blériot)	... 470	15. De Mumm (Antoinette)	40
7. Martinet (H. Farman)	... 389	16. Mollien (Blériot) ...	37
8. Bregi (Voisin) ...	... 292	17. Latham (Antoinette) ...	22
9. Audemars (Demoiselle C.-B.) ...	... 268	18. Gibert (Blériot) ...	... 20
		19. Jullerot (H. Farman) ...	5

"Zeppelin VI" Destroyed by Fire.

RELENTLESSLY misfortune pursues Count Zeppelin and the airships built under his system. The success which had attended the many trips made by the "LZ-VI" from Baden had led many people to think that she at least was destined for a long period of useful service. But it was not to be. Apparently owing to the thoughtlessness of a mechanic while cleaning the engines, some petrol standing in an open pail in the car became ignited, and before it could be removed the fabric of the vessel had caught alight, and in a few minutes nothing but a mass of tangled framework remained. During the eighteen days the airship has been stationed at Baden, she has made 34 flights and carried over 300 passengers. It is said that the airship which is being built to replace the "Deutschland" will be ready at the end of the month, when she will take up the passenger service.

CORRESPONDENCE.

*** *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

Correspondents communicating with regard to letters which they have read in FLIGHT, would much facilitate ready reference by quoting the number of each such letter.

NOTE.—*Owing to the great mass of valuable and interesting correspondence which we receive, immediate publication is impossible, but each letter will appear practically in sequence and at the earliest possible moment.*

SPEED ALARMS COMPETITION.

[757] In setting forth the claims of his proposed apparatus, in the above competition, in the current number of FLIGHT, No. 5, "Truanesco," page 731, states in support of one of the chief features of his design, "that whistles rushing through the air will give forth sound, is demonstrated by the well-known firework rockets loaded with a number of small whistles, which when released travel whistling to earth."

In this I think "Truanesco" is mistaken, for it will be noticed that the pitch of the "whistles" is very high at the beginning of their flight, and that it gradually descends as the "whistles" come nearer and nearer to earth.

As the speed of the "whistles" is constantly increasing from the moment of their descent, the pitch should obviously increase instead of decrease.

I think it will be found on inquiry that the whistling is produced by the very rapid combustion of a compound in a restricted space, this compound probably having as an ingredient picrate of potash.

I do not for an instant intend to suggest that the apparatus designed by "Truanesco" will not do all he claims for it, but merely wish to point out that the parallel he drew did not appear to me to be correct.

A. P. MARKS.

BOMB-DROPPING GUNS.

[758] Your correspondent, Mr. E. Jones, appears to forget that bombs, or anything else, dropped from a height, either with a lateral velocity or not, follow well-known natural laws, and that the necessary corrections can easily be made to ensure their hitting the target. No airship could hover safely even at a height much over 3,000 ft. in the presence of the new vertical fire guns. There can be no doubt that shortly it will be a regular practice for all military aircraft to deliver bombs with precision on terrestrial targets when going full speed at their normal working height. It should not be more difficult to hit a target 50 yards by 30 yards, roughly the size of a battalion drawn up in quarter column, from a considerable height, than it is now for coast-defence guns to hit the small, fast moving target that represents a torpedo boat, a thing that it is common to do with four shots out of five.

Hampstead Norris. "R.A." (retired).

AERONAUTICAL TERMINOLOGY.

[759] *Re* that terminological wonder, the aeroplane! What is it? A bird, fish, boat, motor——? It has wings and a tail! It has a body and fins, spars and outriggers, and a keel!! It is supported on a chassis! And is trussed and strutted like a railway bridge!! A bird flies, a fish "darts," a boat upsets! and a motor runs along the ground—and smells!! So does the aeroplane! It does all these things and more (according to the papers)!

The papers call it a machine heavier than air for the purpose of aerial transit. Man, taking advantage of its mechanical powers (and the weather) leaves *terra firma* for celestial explorations! This *Machine*—it is a machine, a farm labourer, even, or a milkman would term it a machine—that's a point! Now when two or three of these machines, and the men who own them and others who look after, are gathered together, humanity flocks around and calls it a *Flying Meeting*. The newspapers call it a flying meeting! Who said aviation meeting? The word's ridiculous! Aviation meetings? Why? Because the machines aviate? Absurd! They *Fly*!! Ask anybody who knows. They fly!!! If you ever see one of these machines heavenward bound it's *Flying*! If it wasn't, a certain journal—FLIGHT—to boot, would be non-existent! Oh, Mr. Editor, what's in a name?

If these machines are to be called *Flying Machines*, the men who handle them will be called flying machine men! Too long!! Something short and crisp? Here goes—flying men—*Fly-men*!! I've seen these machines fly! and as far as I could follow, the engine was started, the propeller, or rather the tractor (it was a monoplane I'm thinking of) whizzed louder and louder, and the whole thing started to run along the ground! until the fly-man pulled a lever, then the whole lot rose into the air! I was very curious to know how this happened. Why didn't it keep on running along the ground? (some do, I'm told). Because, my informant explained, the man on the machine had altered the angle of a small plane (which worked on a pivoted arrangement in the rear) called an elevator! Because nobody could think of anything else to call it!! Must elevator go? It's a fine term!! To think it's doomed!!! Now, this particular monoplane got up high, and then came down again. The descent was brought about, I was told, by again working the elevator—the result, a magnificent *vol plane* (what a beautiful expression—everyone understands its meaning, even if they don't understand French—standing alone it implies more than a detailed description, vol plane, from the French) to earth. Did the movable elevator alter the angle of the machine to cause descent? If so, the term elevator is misleading, because it facilitates ascent and descent! How would *Tilter* do?

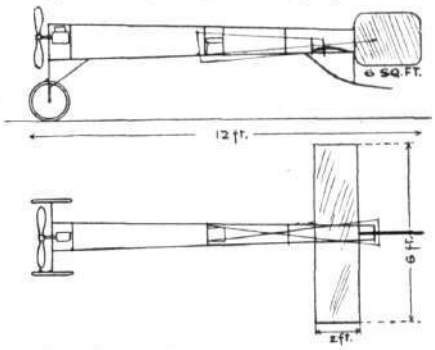
Tilter.—Movable plane controlling the action of a flying machine (monoplanes, biplanes, triplanes, multiplanes, gyroplanes, &c.) when in motion, from zero to angle of flight, from flying angle to angle of descent or gliding angle.

With this I leave flying terminology.

ALFRED W. SWANN.

AEROPLANE PRACTICE WITHOUT WINGS.

[760] I am thinking of making a frame of the Blériot type, with a "lifting-type" tail and rudder, but without any main planes, and of fitting a 2¾-h.p. Douglas motor cycle engine (weight, 39 lbs.) My idea is that the tail shall lift off the ground, and also that the rudder will act for steering purposes. I think this kind of experiment would give me a certain amount of practical experience towards a full-sized aeroplane. Do you think that the 2¾-h.p. engine would pull the apparatus along the ground at 15 m.p.h.? Could you



recommend me the most simple kind of wheel-base that would be strong enough for the purpose that you know of? Do you think that trying to keep the tail at a constant height off the ground would give any really useful experience? I should very much like to know if any of your readers have tried the device, and with what results. Wishing your excellent paper every success,

Marlborough. MAURICE WRIGHT.

[It is very doubtful if these experiments would give really useful results. There is no *need* to rise with a full-fledged aeroplane, unless the pilot desires to do so; and it would be much better to gain experience with an actual machine. After all, the ultimate object of such experiments is to fly.—ED.]

THE PSYCHOLOGY OF SURFACE CONSTRUCTION.

[761] Could you, or any reader of your paper, kindly inform me if what may be termed the psychological phase or aspect of flying surfaces is dealt with, or even hinted at, in any book on aviation? By "psychological"—it is the only word I can think of to express my meaning—I mean the different degrees of sensitiveness to air resistance possessed by different surfaces. Why does the air seem almost as ponderable as water to the feather waved to and fro, while no resistance is felt with, say, a piece of thin metal, wood, or cardboard of area equal to the feather, and waved even much more rapidly? Why does the air seem so highly ponderable in waving to and fro planes made of paper, gold-beater's skin, thin parchment, or a *skin* of any kind, while with planes made of *woven* fabric no ponderability worth speaking of is felt, however air-tight

the fabric may be, however tightly stretched, and however smooth and free from sag or distortion?

If we take say, a hundred, or in fact any number of planes, each of the same weight, area and aspect ratio, but each differing from the rest in the *texture* of its surface—some made of different kinds of papers, some of different kinds of skins, some of different kinds of woven fabrics—it will be found in beating to and fro that the degree of ponderability felt is in no two cases the same. It will be found also that the *best* result among the woven fabrics falls far short of the *worst* result among the papers and skins, even if among the woven fabrics there be the one whose texture most nearly approaches that of a skin or paper, viz., tracing-cloth.

The psychological phase or aspect may have no practical application to the aeroplane: almost any surface which is fairly light and air-tight will *glide*. But I think that if the direct lift or *active* surface type of flying machine becomes an accomplished fact, the psychological phase of the construction of planes must enter into our calculations.

The reason I ask these questions is, I know an experimenter who has for a long time past been trying to produce a direct lifter of the ornithopter or flapping-wing type. I have seen his models (some of considerable size) rise at once from the ground, carrying, when the wings were made either of *skin*, *paper* or *mica*, weights of from 15 to 25 lbs. per horse-power, while in every case in which *woven* fabric was used the lifting capacity of the model was *nil*. The utmost it could do was to flutter or wobble about the ground.

R. SHARPE.

[We should like to hear if any of our readers have conducted comparative tests on this subject, as without a little quantitative data of a reliable kind it is difficult to carry on a profitable discussion.—ED.]

STARTING ENGINES.

[762] A friend informed me recently that, on the Farman biplane, a mechanic had to turn the propeller to start the engine. Would you tell me through the medium of your paper if this is correct?

I have also two more questions to ask:—

(1.) What is the dihedral angle on an aeroplane?

(2.) What are the measurements of Audemars' machine, the Demoiselle?

Apologising for troubling you.

Ilford. "FOURTEEN."

[Nearly all aeroplane engines are at present started by turning the propellers, and this is the case on the Farman.

When the wings of a monoplane slope upwards from the body, they are said to have a dihedral angle.

The Santos Dumont type monoplane has been described in FLIGHT, with scale drawings, Vol. I, p. 604.—ED.]

HELICOPTER *V.* AEROPLANE.

[763] Your remarks with reference to letter 624 are sound as far as they go, but are likely to mislead unless other factors are borne in mind. It is true that the reasoning set forth by you shows the "aeroplane" to be "the helicopter of greatest efficiency," but this takes for granted that the aeroplane wing can be driven through the air with as little loss of engine power as can the blade of a helicopter. Now the blade of a helicopter can be driven from the engine shaft with less than 5 per cent. mechanical loss, but the aeroplane wing cannot be similarly driven. As the average propulsive efficiency of a screw propeller does not exceed 60 per cent., the actual loss of engine power in simply driving an aerofoil as an aeroplane wing is quite 40 per cent. If we take the lift efficiency of an aerofoil at 90 per cent. of the power required to drive it, and the propulsive efficiency of the screw-propeller as 60 per cent. of the engine power, we shall have an over-all efficiency for the system of 54 per cent. of the engine power.

As we are here considering the two systems as weight *lifters*, this 54 per cent. is further reduced by the fact that in an aeroplane we have to travel a considerable horizontal distance in order to rise a short distance, and our head-resistance of body, framework, &c., is thus much augmented. Head resistance varies as V^2, so that an aeroplane rising at an angle of 1 in 30 (a good angle for such machines) experiences 900 (30^2) times the head resistance per unit area of body, of a helicopter *rising* at the same speed. A good rate of ascent for aeroplanes is 1½ miles per hour. A helicopter rising at this rate would experience head resistance of ·00675 lb. per square foot of body, provided it were so constructed that the wake of the screws did not impinge upon the body. The aeroplane, however, for the same rate of *rise*, has 6·075 lbs. per sq. ft. head resistance, due to its unavoidable rapid forward travel.

The great source of loss in a helicopter, as regards upward thrust, is the fact that it is unable to impinge upon the same quantity of fresh air as the aeroplane, but having regard to the low weight-lifting efficiency of the aerofoil driven as an aeroplane wing, it is obvious that we need not increase the diameter of our helicopter to anywhere near infinity in order to obtain as great an upward thrust per horse-power as by the aeroplane system. As a matter of fact, Herr Wilhelm Kress claims to have lifted 25–35 kilogs. (55–77 lbs.) per horse-power with a helicopter of 4 metres (13 ft. 1⅛ ins.) diameter. (*See* his book published in 1905.) This is considerably superior to the lift of an ordinary aeroplane. (The Wright machine, one of the most efficient aerodynamically, lifts 40–45 lbs. per horse-power.) Other investigators have been unable to attain to Kress's figures, their best lifts being between 10 to 20 lbs. per horse-power. They have, however, used rigid blades, while Kress used elastic blades (of large area and fine pitch, with considerable camber).

We can augment the lift of a helicopter without increasing its diameter by giving it a horizontal rate of advance (thus enabling it to deal with fresh air every revolution). Provided the rate of advance can be obtained economically, it then becomes a much more effective weight lifter than the screw-driven aeroplane. Experiments at the Koutchino Aerodydamic Institution have shown that if a screw-propeller of 30 cm. diameter (6° constant inclination of blade) be subjected to a blast of air travelling at right-angles to the propeller-shaft at 6·2 metres per second, the ratio of lift to power is augmented 2·6 times over that obtained in still air.

It would take more space than you have available in your correspondence columns fully to examine all the aspects of this question, and I will now leave the matter in the hands of the champions of the helicopter as the ultimate type of flyer. I am not of their opinion, as although it can be made to lift heavy weights more conveniently than can the aeroplane (which is simply puerile as a weight *lifter*), it suffers from the serious defects of all rotary propeller systems for aerial use. Their rotation renders it impossible for them to obtain an aerodynamic efficiency equal to that of an oscillating propeller system, whatever superiority they may have mechanically. I hope to return to this point at a later date.

Surbiton. OCTAVIUS.

GYROSCOPIC CONTROL.

[764] With reference to automatic stability, I have a provisional protection for the following method, which is certainly original if nothing else. A 6-ft. lever is pivoted at its centre so as to swing either way, and connected with the elevating plane. At each end of the lever is a small surface about 6 sq. ins., normally hidden behind a shield. One or other of the surfaces is capable at a time of being slid from behind its shield, so that the pressure of wind caused by flight may act on it, and so press that end of the lever back, raising or depressing the elevator. These surfaces are brought into action as required by means of Bowden wires in communication with a small gyroscope, the movements of which, caused by the tilting of the aeroplane, would actuate the wires. As the only duty of the gyroscope is to slide the surfaces in and out of action it need only be a very small affair of a few pounds in weight, and could be driven by electricity from accumulators. I have no time to develop this idea, but perhaps one of your readers may like to get into touch with me about it with a view to carrying it on.

Lincoln's Inn Fields. JOHN V. L. HALL.

THE CYCLOPLANE.

[765] *Re* the cycloplane, letter No. 599. Mr. John Gaunt states in that letter that "there is no propeller fixed."

Surely there is a mistake here, for his patent specification, No. 17,014, August 13th, 1908, sheet 3 of drawings, shows two two-bladed propellers fixed; he also claims in paragraph 3 that propellers may be used to sustain flight.

Re letter No. 598. It will be money thrown away for anyone to patent a cycloplane, as it was anticipated thirteen years ago.

A Mr. Edward Newall, of Chester, was granted a patent, No. 5,739, dated March 4th, 1897, for a flying machine consisting of wings or vanes (*i.e.*, planes), hinged, balanced, and propelled by fans, &c., also planes that support a saddle for the operator, and a treadle from which the propelling fans are driven. It would be interesting to know whether the renewal fees were paid, or whether the patent lapsed. If the latter is the case then anyone can make a cycloplane without let or leave. I have a cycloplane protected under No. 4,229 of February 10th, but anyone can have

it for the price of a 20-h.p. second-hand aero engine which I am in need of.

Anyone making a cycloplane must not make or use any device that is the subject of a patent separately.

Bristol. CAMERON WALKER.

FLYERS AND YACHTS.

[766] In reference to the article in FLIGHT entitled "Flyers and Yachts," it is mentioned that a designer is unable to make a machine of low aspect-ratio strong and light. This is true in the case of a monoplane, but the fact that Mr. Roe has done this in a triplane is overlooked; his machine is both strong and light. Also it is most important to have a high aspect-ratio, as it makes an efficient plane, viz., Horatio Phillips' theory. In the section of the article headed "Devices for Economy" it is mentioned that the planes should be pointed and have less camber at the tips; this is done on the Martin Handasyde monoplane. The only objection is that the machine would theoretically lose in stability, as it is supposed to be better to have the planes thicker at the tips than in the centre for good stability.

Hexham. T. G. M.

FLYING WITH THE WIND.

[767] In reference to the description of Mr. Drexel's return flight to the Beaulieu aerodrome the other day, in a recent issue, the writer states that the machine had to be kept with the wings at a very steep angle of incidence when travelling down wind, to keep a horizontal course, although presumably the engine was working at its usual speed.

From this it may be gathered that an aeroplane will not travel with the wind at the same air speed as it will against (power being equal), owing no doubt to the power required to overcome the inertia of the mass, being in proportion to the land speed.

In other words, an aeroplane travelling overland at 20 m.p.h. against a 20 m.p.h. wind (*i.e.*, 40 m.p.h. air speed), will require more power to travel down the same wind at the same speed (which would be 60 m.p.h. land speed), or otherwise the elevator would have to be deflected for ascending, in order to keep a horizontal path of flight, as was the case with Drexel. This, of course, would decrease the speed.

Chiswick. WALTER E. FOX.

HELICOPTERS.

[768] Writing in reply to Mr. L. G. Wray, of Barnes, *re* helicopter-aeroplane, it may perhaps interest him to know that I have already experimented in this field, and the results have been such as you have already suggested under his letter. I have been interested in aeronautics for several years, and I certainly wish to save fellow-readers of FLIGHT who may be imbued with the helicopter idea from a lot of unnecessary expense in proving it useless.

With reference to another matter, viz., automatic stability, referred to by Mr. Bath, of Newport Pagnell, I should like to say that I experimented with the idea in question about four and a half years ago. I should now like to make a suggestion that may appeal to pilots of monoplanes, which is that a looking-glass fitted after the manner of those on motor cars for seeing behind would overcome a difficulty which I have heard several of them complain of—that they are unable to see how much they move the elevator tail. When learning to fly a monoplane this is frequently the cause of the excessive jumping and diving that results before the pilot learns to properly feel his machine.

Sunderland. J. E. REDHEAD.

MODELS.

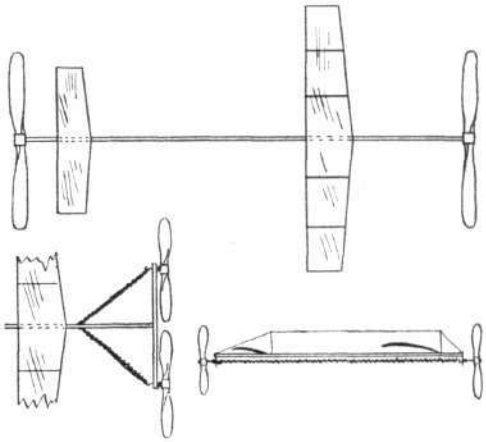
MODEL CONSTRUCTION.

[769] Seeing that I can claim two or three years' experience with model aeroplanes, I take the liberty of replying to letter No. 657.

The following are points I strongly advise, together with approximate dimensions:—

1. Use a plain fusellage; I prefer a plain stick.
2. Use single-surface fabric planes, built up of split bamboo and Jap silk or tissue paper.
3. Use twin propellers.
4. Commence with a monoplane.

Make main stick 2 ft. long, ¼ in. by ¼ in.; the main plane 15 ins.



by 2 ins., average width; propellers 9 ins. Two methods of arranging the propellers are shown. The whole machine should weigh about 1 oz.

Carefully follow instructions and the machine *will* fly.

Coventry. L. MEEK.

AN 18-OZ. MODEL.

[770] We enclose herewith two photos of one of our models that may be of interest to readers of FLIGHT.

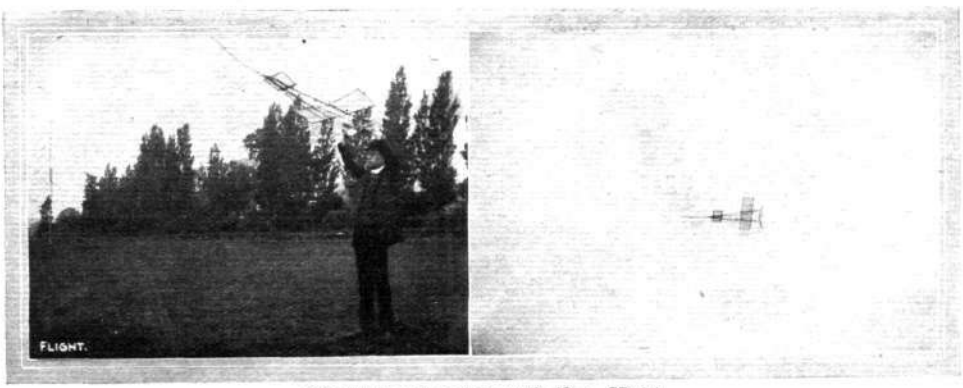
The model was flying in a high wind, and the second photo shows her heeling over whilst going across the wind.

The machine has a span of 3 ft. and a supporting surface of nearly 2½ sq. ft. The length is 4 ft. 6 ins., and weight 18 ozs.

Brunswick Park, New Southgate. LOVELL AND BARRELL.

ELASTIC MOTORS.

[771] Will some reader kindly tell me what the weight of an elastic or clockwork motor should be to drive a model Farman



Messrs. Lovell and Barrell's 18-oz. Model.

biplane, 1-in. scale. I have completed the model except for the motive power, and it weighs with the propeller 8½ ozs. Total supporting area is 539 sq. ins.

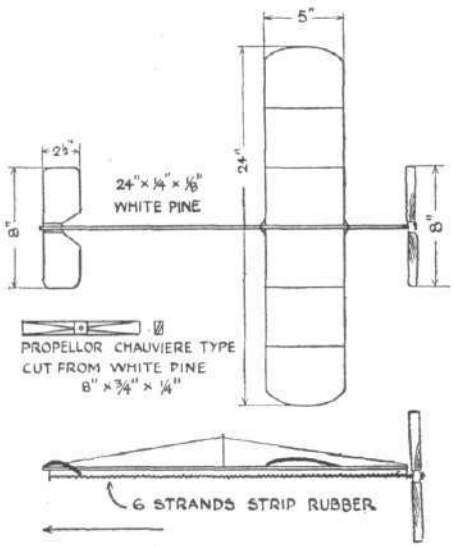
Muswell Hill. R. A.

MODEL CONSTRUCTION.

[772] With reference to letter No. 657, from Mr. R. G. Pinnock, I enclose herewith a rough sketch of a monoplane which I have made, and which I think should do for him to begin with. It is noticeable that I have left out all unnecessary fittings, such as built-up fusellage, chassis, &c.

Dimensions: Main plane 24 ins. by 5 ins., camber ½ in., made of ⅛ in. by ½ in. white pine main spars, and ⅛ in. by 1/16 in. cane cross-spars. This is then covered with stretched mercerised lawn, and then oak varnished.

The elevator, 8 ins. by 2½ ins. by ¼ in. camber, is cut out of thin cardboard or celluloid. The frame is just a simple white pine stick,



24 ins. by ¼ in. by ½ in., stayed in the centre by a piece of flower wire stretched over a mast made of half a hair-pin. The propeller is cut from white pine, 8 ins. by ¾ in. by ½ in., and the shaft consists of a cycle-spoke cut down to 2 ins., with the nipple cut in two. Method of fixing propeller is obvious.

The propeller is driven by six strands of strip elastic. This machine should weigh from 2 to 3 ozs. It is an extremely straight flyer, and is adjustable for height and direction.

I trust that you will consider this suitable for insertion in your valuable paper. I may say, in conclusion, that I shall be only too pleased to explain anything that is not quite clear.

Govan. JOHN S. GORDON.

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PUBLICATIONS RECEIVED.

Aerial Navigation. By Frederick Walker, C.E. London: Crosby, Lockwood, and Son. Price 5s. net.

Liquid Fuel. The Anglo-American Oil Co., Ltd., 22, Billiter Street, E.C.

Announcements, Educational and Social, for the Session 1910-11. Northampton Institute, St. John Street, E.C.

OFFICIAL RECORDS.

Distance and Duration.—Olieslaegers (Belgium), at Rheims, on a Blériot monoplane with Gnome engine: 244·309 miles in 5h. 3m. 5⅘s.

Speed.—J. Radley (Great Britain), at Lanark, on a Blériot monoplane with Gnome engine: 1 mile in 47⅘ secs. = 75·95 m.p.h.

Altitude.—J. A. Drexel (Great Britain), at Lanark, on a Blériot monoplane fitted with Gnome motor: 6,750 feet in 52 mins.

Aeronautical Patents Published.

Applied for in 1909.

Published September 22nd, 1910.

21,045. J. M. TURNBULL. Flying machines and gliders.
21,373. E. JACQUELIN. Flying machines.
27,140. R. ARNOUX. Aeroplanes.

Applied for in 1910.

Published September 15th, 1910.

171. A. NEUFIELD AND S. MAITINSKY. Safety aeroplanes.
2,302. P. LEHMANN. Airships with aerostats.
4,433. H. ERDMANN. Refilling aerial vessels.

Published September 22nd, 1910.

1,125. A. RIESTER. Aeroplanes.
9,950. W. H. WALTERS. Apparatus for teaching aeroplaning.

DIARY OF FORTHCOMING EVENTS.

British Events.

1910.
Sept. 26-Oct. 1 Burton.

Foreign Events.

1910.		1910.	
Sept. 24-Oct. 3	Milan.*	Oct. 17-25	St. Louis. Gordon-Bennett Balloon Race.
Sept. 25-Oct. 3	Biarritz.	Oct. 29	New York. Gordon-Bennett Aviation Cup.
Oct. 8-16	Ostend.	Dec. 4-18	Marseilles.
Oct. 15-Nov. 2	Paris Aero Show.		

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